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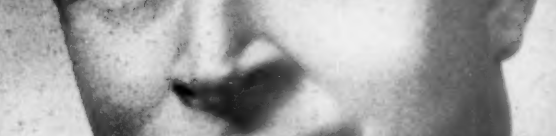

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PRESIDENTIAL ADDRESS *

The Psychiatric Public Health Aspects of War

By GEORGE H. STEVENSON, M.D., London, Canada

A year ago in Cincinnati, this Association, 95 per cent of whose membership are citizens of the United States, elected to its presidency with the utmost generosity and good will a citizen of Canada. This honor is deeply appreciated by Canadian psychiatry and by me, mindful as I am of my own personal and scientific inadequacies. This kindly action on your part is but one more indication of the fine friendship which has existed between our peace-loving nations for a century and a quarter, during all of which time not a gun has appeared on our common border. As the great President of your great nation so aptly stated in an address some time ago, the Great Lakes and the 49th parallel do not separate our countries, rather do they join them together. While thanking you for the high honor you have conferred on me, I should also like to thank you on behalf of so many Canadian psychiatrists for the opportunities we have had of visiting your hospitals, universities and training centers and for the great kindness you have invariably and unfailingly shown us as we sought to increase our psychiatric knowledge in your hospitable land. May I also take this opportunity of expressing to you and to the American people the deep gratitude of the people of Canada and of the Empire for the sympathy, encouragement and magnificent practical assistance you have extended to us as we struggle to preserve ourselves and the civilized way of life.

A year ago we met in good faith and good fellowship, while across the Atlantic the European nations which gave birth to us or to our ancestors were engaging in a terrible war, with huge destruction of health, happiness and life. This suffering was borne and continues to be borne, not by the governments nor by the state nor by individual statesmen, but by the great mass of ordinary citizens, who having no natural animosity to other plain people, are yet required to kill and be killed, because of forces over which they have little or no control or even understanding. Desiring only what we also desire —life, liberty and the pursuit of happiness— this terrible plague of war has again swept over the ordinary people of the world, individually and collectively.

It would appear reasonable to conclude that any set of circumstances which causes great loss of life, physical damage, physical and mental ill health, could properly be regarded as a public health problem. And because in the etiology, pathology and symptomatology of wars there are involved many conscious and unconscious psychological and psychopathological factors, it would also appear that preventive psychiatry should take some responsible part in the attempt to protect the common people from the effects of this terrible scourge. I should like therefore, to request your consideration of some of the psychiatric public health aspects of war.

Bertrand Russell has rather cynically stated that the best achievement of preventive medicine has been the saving of the lives of many babies until they are old enough to die as soldiers on the battlefield. If we must admit there is some truth in this charge, perhaps it will not always be true. Moreover, if we agree that war is an utterly unintelligent method of settling disputes and if we further agree with Conklin that intelligence is the capacity of profiting by previous experience, we should perhaps consider it our duty as psychiatrists to develop in the people and their leaders the use of intelligence as the best aid to the healthy growth of humanity and civilization and the control or elimination of those factors which make for war.

Some people will contend that wars are inevitable, that they always have existed and always will exist, that there is some instinctive war-like tendency so deep-rooted in human nature, that any thought of eliminating wars as a recurring expression of human nature is fantastic and Utopian. I very much

* Delivered at the ninety-seventh annual meeting of The American Psychiatric Association, Richmond, Virginia, May 5-9, 1941.

doubt that this is the opinion of psychiatrists generally, although I cannot find that this Association has ever been polled on the question. A closely related body, however, the American Psychological Association, through a questionnaire submitted to its members by Dr. J. M. Fletcher (1) did express an answer to a question worded as follows: "Do you as a psychologist hold that there are present in human nature ineradicable, instinctive factors that make war between nations inevitable?" Of the 378 replies, 346 were in the negative, only 10 being in the affirmative, the remaining 22 being indefinite. We might pause long enough to quote from two or three negative opinions:

H. H. Goddard: "No! Nothing that intelligence and education cannot eradicate."

A. S. Otis: "Positively *not*. Anyone who thinks so is densely ignorant of political affairs. Wars are artificial, strategic, political, trumped-up and forced upon us."

Adolf Meyer: "The abolition of duels in Anglo-Saxon society is a striking and suggestive fact worth remembering."

George Stratton (2) and many others have pointed out that in addition to dueling, other forms of anti-social behaviour deeply rooted in human nature, such as human sacrifice, cannibalism, blood feuds and slavery, have been eliminated by intelligence, effort and education. It might also be noted that not so long ago certain diseases, for example, smallpox, typhoid fever and diphtheria were considered just as inevitable as wars, but the same patient efforts have completely abolished them.

Before leaving this aspect of the subject, reference might be made to an article by Havelock Ellis (3) published just after the close of the last war, in which he contended that wars are unnatural and infrequent even among primitive peoples. He expressed the belief that civilized peoples might expect to end wars, not by love nor by reason (education) but by sublimation of their unconscious aggressive and hostile tendencies. Although not a psychiatrist, Havelock Ellis was talking our language and, in effect, pointing out that psychiatry has a responsible task to perform.

The increasing destructiveness (and expense) of modern warfare, the vast numbers of people engaged, the bombing not only of military objectives but also of non-combatant men, women and children, the huge refugee problem—all these factors involving so many sufferers make modern wars totally different from all preceding wars, most of which shrink into relative insignificance. In the forty years since the turn of the present century we have seen, beside innumerable skirmishes, the Russo-Japanese war, the Balkan wars, various South American wars, the World war, the Sino-Japanese war, the Italian invasion of Ethiopia and Albania and Greece, the Spanish civil war, the Russian attack on Finland and the present European conflict. In these wars perhaps twenty million people have died, twice as many have been wounded and untold millions have suffered damage to their health, physical and mental. Can we as physicians regard this destruction and damage to the personalities of the masses as anything but a public health problem of first magnitude? Granted that there are many other problems involved, economic, territorial and political, nevertheless to us as psychiatric physicians, the public health problem will be uppermost. Certainly if these huge numbers of persons suffered death or impairment of health through any other plague or epidemic we would not be unmindful of the challenge to public health. We did not always regard industrial diseases and accidents as a public health problem but we now do so. Similarly, it took us a long time to see public health problems for the medical profession in the injuries and deaths resulting from motor accidents, but these are now drawn forcibly to our attention by Selling (4) and others as a challenge to public health and mental hygiene. In the same way alcoholic problems, formerly regarded as moral and economic, are now regarded as a major public health responsibility, and are being attacked by the Research Council on Problems of Alcohol, an associated society of the American Association for the Advancement of Science. If the damage done to great masses of people by industrial accidents and diseases, by motor traffic and by alcohol can be properly regarded as within the field of public health, so must we also regard the damage done to great masses of people by war.

If the effects of war were restricted to physical death, physical wounds and physical

disease, the psychiatrist might decide that other public health agencies should undertake the entire medical responsibility. Actually however the pychiatrist has large interests because of the psychiatric disabilities in the armed forces produced by war; because of the minor as well as the major mental sicknesses induced in many of the civilian populations; because of the responsibility that is his for the proper psychiatric examination of men taken into the national service; and because of the leadership the psychiatrist must give to the development of mental health as a positive factor making for the unity and security of the people.

The activities listed in the foregoing paragraph are the more obvious public health duties and responsibilities of organized psychiatry in time of war or preparedness for war. And at this time I should like to pay tribute to our committee on military mobilization, headed by Dr. Harry Steckel, for the splendid work it has done to assist the government in its plans for preparedness during the past two years.

Important and valuable as are the psychiatric services rendered in time of war, I would suggest that preventive psychiatry has a still greater work to do in time of peace to assist in the efforts to prevent the occurrence of wars. This challenge comes to us because of the close relationship between the etiological factors as seen in the individual psychosis and in the international psychosis—war. While we do not for a moment set ourselves up as authorities on international affairs, economics or commerce, which are often held responsible for international difficulties, nevertheless, we do know that there are many psychopathological factors constantly determining toward war, which we as psychiatrists are able to evaluate more adequately than other groups who have not had our type of training or experience.

We know that certain emotional states, for example fear, induced from whatever set of circumstances, whether they be actually threatening or only apparently so, will lead the fearful individual or nation to certain beliefs concerning the fear-inspiring stimulus, which may not be actually warranted. Such beliefs might be that the supposedly dangerous set of circumstances, whether they be man, beast, nature or nation, are vicious, aggressive, hostile, depraved, immoral, murderous and so on. The appearance of such beliefs (which may be delusions) calls forth a still greater feeling of fear and active attempts to reduce the feeling of insecurity, engendered by the fear, by the erection of defences (isolation, flight, armaments) or by an attempt to destroy the supposedly threatening enemy. Does anyone here doubt that if the warriors on Mars were real and were within striking distance of Earth, we on Earth would not be uncomfortable and fearful and that war between Earth and Mars would be just as probable as war between Germany and Britain?

We know something of the mass mind and how easily at times it can be influenced in its emotional reactions, its beliefs and its behaviour. We know how suggestible and how hypersuggestible is the mass mind under certain circumstances. We know that unhealthy responses in the mass mind may easily be aroused by suggestive propaganda emanating from irresponsible or unprincipled demagogues, who for their own purposes may only too often be willing to stimulate fears, hatred and aggression, personal or national.

We know something of the seductive attractiveness of certain aspects of war, made more so by excitement, color, martial music, appeals to patriotism, rewards for valor, but above all for the opportunities presented by war to relieve the tedium and monotony of civilian life, to offer an escape from responsibility, unemployment and domestic unhappiness.

We know too from psychoanalytic teaching something of the psychologic factors, not conscious to the individual, which make him willing to kill and equally willing to suffer and die.

As psychiatrists we perhaps are better acquainted than most with the factors that produce people with a mission, dangerous demagogues, paranoid personalities, psychopathic saviours of their countries. Even the saner leaders may be unduly aggressive and pugnacious, a hazard which Bluemel (5) has referred to in the following words:

"If the leader is sufficiently dominant, he compels events in the direction of his own will, and the nation soon finds itself at war in spite of its peaceful temperament. In this connection one may well express a doubt whether any nation would ever

have fought another nation if the people had followed their own inclination rather than the will of their leaders." He goes on—"Mental misrepresentation is at its worst when a people is ruled by a dictator. The dictator reaches his position of dominance by reason of his aggressive personality, and he must necessarily possess in a marked degree that militant spirit that sets him apart psychologically from the people whom he governs."

The psychologic and psychopathic factors in the problem of leaders and the led are well presented in a recent article by Lawrence K. Frank (6). He comments on the fact that the hostility and destructiveness of certain leaders find a ready response of loyalty in the masses, who in following their leader find release for their own pent-up unconscious hostility. This emotional surrender of the masses to a leader presents one of the most difficult problems to those who hope for increasing use of intelligence in the determination of conduct. Psychiatry, and psychoanalysis in particular, should have something to say about the qualifications for political leadership as a safeguard against the undesirable results of emotional interplay between a leader and those who would follow him.

One might enlarge on some of these points or increase their number but I think it unnecessary to do so as most of you will readily agree that because of our specialized knowledge of the mechanisms making for individual psychoses, we have also special knowledge of the mechanisms making for war—the international psychosis. I would suggest that because of this special knowledge we have a responsibility, not only to try to prevent individual psychoses, but also to do our part to try to prevent national and international psychoses. Complaint may be made that until we have shown ability to prevent individual psychoses (as shown at least by a decrease in the number of first admissions to mental hospitals) we should not attempt the larger problem of promoting and preserving international peace of mind. My only answer to this criticism is that psychiatry does point the way to individual mental health, but that education in the principles of mental hygiene is not enough. The environment, largely controlled by statesmen and politicians, is of equal importance for the maintenance and preservation of health. This statement probably applies with equal cogency to the health of nations, and psychiatry has an equal duty to make known to nations and their leaders the psychologic and psychopathic factors which predispose to war, or, on the positive side, will lead to national health.

As individual psychiatrists we recognize the psychiatric public health aspects of war, first, in the huge damage, physically and mentally, war causes to the average citizen multiplied millions of times in most countries of the world; second, the psychopathologic causative factors of which we have special knowledge; and third, our recognition, as the largest body of organized psychiatrists in the world, that wars are not inevitable but are preventable and that we, working with others, have a responsibility to endeavor to do something to put an end to this constantly recurring plague which takes such a heavy toll on the happiness and achievements of the average man and woman.

The suggestion that organized psychiatry should take a more active and responsible part in the effort for elimination of the war psychosis is by no means original. The National Committee for Mental Hygiene gave thought to this problem in the first decade after the last war. Clifford Beers well summarized the situation in a foreword to a published paper by the late Lt. Col. John R. Lord, M. D., as follows (7):

> Another problem to the solution of which the mental hygiene movement should have something of vital importance to contribute is that of world peace. This subject has been discussed off and on for several years by representatives of various mental hygiene organizations and it seems right, in these troublous times, to urge that the mental and emotional attitudes of peoples and of statesmen as affecting world peace shall receive from now on the focussed attention, not only of those connected with mental hygiene organizations, but also of those who are connected with the many organizations and agencies that are working directly and more or less exclusively on the problem of world peace.

Dr. Lord in his paper tells a little of the planning for the First International Congress on Mental Hygiene and quotes from a letter he wrote to Clifford Beers:

> The reign of peace throughout the world depends upon the cultivation of mental hygiene. Like individuals, nations have adjustments to make. A healthy national mentality does not look for war; for are not all wars reactions to buried conflicts? The bringing of these conflicts to the surface, the digestion and disposal of them, is the art of making peace.

At this Congress, held in May 1930, an address was delivered by the Honorable Ray Lyman Wilbur, M. D., secretary of the Interior, who is quoted by Dr. Lord as having said, "that, as a statesman, he saw in mental hygiene a movement of great import for international reactions, with special reference to the peace and war problem."

At the conclusion of the Congress Dr. Lord commented on the formation of the International Committee for Mental Hygiene, arising out of the Congress. He expressed the hope that

> there can come about an understanding between nations which will not be under the sway of national pride, prejudice, or economic factors as hitherto, but in which social, moral, and spiritual values will have first place. To bring these international thoughts to bear upon individuals and nations is the mission of the International Committee for Mental Hygiene. Its establishment is thus the commencement of a new era in the progress of humanity.

Brave hopes, brave plans, mocked by subsequent events.

You will recall that in 1935 the Committee for War Prophylaxis, sponsored by the Netherlands Medical Association prepared a short manifesto (8) on war prevention which it circularized to the leading statesmen of all nations. This document was signed by 339 psychiatrists from 30 nations. It emphasized the unintelligence of war, the danger of a war-planning mentality, the instinctive and unconscious factors influencing toward war and the responsibility of statesmen to solve international difficulties by reason. It concluded with the brave and challenging statement that "we psychiatrists declare that our science is sufficiently advanced for us to distinguish between real, pretended, and unconscious motives, even in statesmen." It is only fair to say that polite acknowledgments were received from practically all countries but subsequent events do not indicate that psychiatrists were regularly consulted or their advice taken.

It might be noted here that the National Council for Mental Hygiene of Great Britain was so impressed with the Dutch suggestion, that at its 4th Biennial Mental Health Conference, held in January 1936, it considered the formation of a committee on war prophylaxis, to be constituted of psychiatrists and psychologists, to study ways and means of promoting friendly international relations. A few meetings were held but it was decided there was insufficient time to do anything to prevent the coming storm.

Dr. C. Macfie Campbell, a signatory of the manifesto of the Netherlands Medical Society, in his Presidential address (9) to this Association in 1937, referred to the psychopathological elements in war and I should like to quote briefly from his comments:

> In the complicated field of human relations there is no single feature so startling as the mass destruction of one's fellow creatures because of conflicts as to beliefs or material possessions. Yet war is a commonplace; it is accepted by some as if it were an inevitable condition of human existence on this planet, as if human nature had some ineradicable tendency bound to express itself in recurrent outbursts of mutual destruction. With this fatalistic attitude all the skill and all the intellectual processes of man may be made subservient to the accomplishment of this destructive task.

Referring to the need for intelligent leadership, he stated:

> Thus while paying tribute to the noble impulse which inspired the Netherlands appeal to the statesmen who direct the thunderbolts, we may be a little uncertain as to how far they have control of those thunderbolts and as to whether their fixed pre-occupation and official entanglements may not prevent any efficient response.

Finally, referring to the part psychiatrists might play in international affairs, Campbell goes on:

> Man's happiness, however, depends on more than material comforts, it depends on the nature and finality of human relations, on his attitude to the cosmos, on his response to spiritual values. In the muddled state of human affairs, blind, instinctive and unconscious forces will continue to be operative, but it is our task to see that rational considerations play an increasingly important rôle. Foremost among these considerations is sound knowledge of the component forces of human nature, and of the forces at play in group life.

In the following year (1938) appeared Dr. Karl Menninger's remarkable book, "Man Against Himself" (10), in which he challenged psychiatrists to take their place in this war against war in the following words:

> Indeed, the shadow of universal war looms before us as I write, threatening to substitute for the petty individualistic and nationalistic self-destruction another convulsive effort at world suicide

more violent even than that represented by the war of 1914 to 1918. The spectacle of such almost joyous preparation for mass suicide as is even now in progress cannot but fill the reflective observer with awe. The recent brave pronunciaments of the psychiatrists of the Netherlands pointing out the antithesis of medical science to such destructiveness is so sensible and so obvious that it would seem to answer all arguments, yet we realize how utterly futile and vague such feeble protests are against the unreasoning mass of hatred so easily aroused and released in mob action. For the solution of such world difficulties it would seem an absurd presumption for the scientist to make suggestions were it not for the conviction that in the deeper study of the psychology of the individual, the analysis of the origins and manipulations of the destructive tendencies, one may expect to find the key to the salvation of mankind.

We are aware, even at this crisis, of weak but insistent opposition to war on the part of single voices and intelligent minorities. To such intelligent minorities should belong all physicians.

Another distinguished fellow of this Association, Dr. E. A. Strecker, in his Salmon lectures of 1938, published under the title, "Beyond the Clinical Frontiers (11)," made some very pertinent remarks on this subject. I take the liberty of quoting him briefly:

Perhaps communism, fascism and totalitarianism are instances of wholesale rationalization. The communal good of the people or the glorious progress of the state or its racial purity are the fronts, the "noble purposes," the rationalizations to which are dedicated tyranny, oppression and the assassination of personal liberty and life.

And again:

Unquestionably the world is sick—mentally sick. The cosmic indisposition seems to have involved large segments of every vital organ and the sickness is economic, political, cultural and spiritual. Political opportunism offers panaceas of communism, fascism and totalitarianism. In practice they all operate by attempting to produce an intense nationalism. Mental hygiene can scarcely regard them as realities offering much incentive to recovery. Rather would they seem to be mass psychopathologies. The psychiatrist need only widen the periphery of his vision in order to see the numerical magnification of many of the errors of his psychoneurotic and psychotic patients. Does the world remain sick because it is unable to see any promise of weal or satisfaction in the future? Among the extant political idealogies and practices, democracy comes closest to a fulfillment of mental hygiene ideals of mature and independent thinking.

Furthermore, only three months before the outbreak of the 2nd World War there was held in Lugano, Switzerland, the sixth European Congress on Mental Hygiene, all the larger countries being represented and many of the smaller, the general theme for discussion, ironically enough, being "the problem of mutual understanding." The papers were published in *Gesundheit and Wohlfahrt* for August–September 1939. Although these papers were of a very high order and emphasized the problems of international understanding and misunderstanding, the tragedy was that less than three months later all Europe was aflame with war. As a part of the discussion at the Conference were some remarks by Dr. Gelpke (12) of Basel which I should like to quote as summarizing the part he felt psychiatry should be able to play in the prevention of wars. Translated freely and not verbatim he said that the problem of agreement between nations was fundamentally one of mental hygiene.

"Anyone," he said, "who has seen war at first hand, its horrors and the appalling damage suffered by both victor and vanquished, need not be a professional psychiatrist to appreciate the insanity of this attempt to resolve contradictions by methods which make the evil worse. It is the reaction of a peasant who gets drunk, beats his wife and breaks all the kitchenware because he loses a cow. War is a totally obsolete method of settling disputes between component states of unions like the United States of America or Switzerland. The war of 1914-1918 proved that any war between civilized peoples is really a civil war. The pseudo-peace or three-quarter war, which has been going on ever since 1918, has continued to emphasize this. Where misunderstanding and delusions lead to injury, that is the place for the psychiatrist." He continued, "A mass psychosis is abroad like plague or cholera transmitted from one person to another. It utilizes the instincts that are active in murders committed for pleasure—it is in fact a regression to the semi-bestial condition of Neanderthal man, a breaking through of the subconscious levels which have ruled mankind far longer than kindness, comprehension and love."

Dr. Gelpke concluded with an expression of hope that a permanent commission of psychiatrists could be set up to act in an advisory capacity on international problems.

Is this a reasonable suggestion? Has psychiatry anything to offer the people that might safeguard them against the havoc of modern warfare? Having in mind the lack of response to the Dutch proposals and recalling that within three months of this sixth meeting of the European Congress on Mental Hygiene, war was again engulfing Europe,

have we any reason to think that these proposals should again be urged or have we any reason to think that there is any way in which psychiatry can seek to prevent the damage to millions of people through war?

These voices crying in the wilderness have pointed out the path, rough and difficult though it may be, that psychiatry must follow if it is to carry out this part of its manifest destiny. Psychiatry has grown up; it must assume leadership in the tasks that properly belong to it.

Well-meant addresses, carefully prepared resolutions are not enough. Much thought, work, organization and money are needed for a public health problem of this immensity. Permanent machinery needs to be set up to exert a constant and growing pressure on public opinion. National mental health principles have to be taught by us and learned by the public and its leaders. Rigid standards of qualification may have to be set up for those who aspire to lead us, qualifications which would have to include special training in economics, sociology, political science and especially psychology and psychopathology. Advice on the effect of various types of environment upon health would have to be given.

True, in the United States the Public Health Service has in its personnel psychiatrists of outstanding ability but their individual duties and other considerations may make it difficult for them to advise the government forcefully of all the factors involved. It therefore becomes the duty of this Association to accept leadership in this psychiatric public health problem.

If this Association accepts the challenge, as I feel confident it will, knowing something of the imagination, courage and constructive ability of its membership, I would offer the suggestion that Council approve the appointment of a Committee on International Relationships, of carefully selected personnel, which would have no other Association duties than the study of the problem, the formulation of plans and the putting into action of those measures for carrying out the objectives for which it is formed. This committee might also be expected to urge the official psychiatric associations of all other nations to form similar committees. These committees could pool their knowledge, experience and plans and each would act in an advisory capacity to its own government and its own people.

Recognizing that others of the social sciences have definite contributions to make to the solution of this hitherto unsolvable problem, these might likewise be urged to set up co-operating committees. One can readily visualize a group of such committees in each nation working towards the common objective. It would need to be kept in mind that such committees would be articulate, energetic and constantly alert to the development of any factors which by their effect on the people might possibly lead to war. In this connection Childs (13) has advocated frequent surveys of public opinion in order to keep closely in touch with ideas which may be disturbing the public mind. "By means of frequent census-taking," he says, "we can forewarn ourselves of the presence of a rising tide of hatred. Before we can do much about it, however, we need to know the causes. And in so far as those causes have a propagandistic origin, that should be ferreted out. The exposure itself in many cases will effect the cure." Without looking too far ahead, and having in mind that the first step should be the establishment of our own committee on international affairs, nevertheless, it might be assumed that after a number of psychiatric associations of other nations have taken similar action, as well as other associations in the social sciences, such committees might gradually become emancipated from the parent bodies to form an international federation of the social sciences with the main objective of bringing more sanity into international relationships.

It will be understood, of course, that these recommendations with reference to other countries are not feasible until the present world conflict has been brought to a satisfactory conclusion. This continent, and particularly the United States, is the hope of the world for the supremacy of the civilized way of life. This Association therefore in order to give needed psychiatric leadership after the present war, should make its plans now.

This is the challenge to this Association. Are we ready and willing to accept it? Not in the future but now. We know that there

will be other wars. We know that wars beget wars. We know that so long as nationalism tends to preserve itself by the building of armaments, so long will there be wars. We know that so long as primitive and unconscious drives continue stronger than reason, education and sublimation, so long will there be wars.

Knowing all these things, knowing the difficulties to be surmounted, knowing our own limitations, is the task too large for us even to start? The challenge is as much to our courage as to our energy and ability. The medical profession has always been willing to face the dangers of disease, accident and death on the battlefields and on the high seas, in yellow fever districts, in mine disasters, in floods, wherever our services are needed. In this terrible plague of war, not only soldiers, sailors and airmen call for help—the civilian women and children ask us to try to save them and their loved ones from war. Our children and their children will call for aid. We cannot refuse our every effort.

If events are left only to political leaders and to the emotional reactions of the leaders and the led, you and I know that in 1965, or some such year, the babies our colleagues are now ushering into the world will suffer and die by the millions in another fratricidal war. The ordinary man, the ordinary woman and child pay in blood, tears, and taxes for this fearful psychosis, a psychosis essentially preventable, not preventable by us alone, or by any group alone, but by the intelligent cooperation of all bodies in the social sciences, not least of which should be preventive psychiatry.

The first century of our existence as an Association of psychiatrists is near its close. We can say with pride that we and our predecessors have labored well for the better care and treatment of the mentally ill, for the better understanding of the causes of mental illnesses, for the spread of principles of mental hygiene. We have not shirked our responsibilities. Nor will we shirk them in the second century shortly to commence. Who can foresee the achievements of psychiatry in the next hundred years? When the history of our second century comes to be written, may it be recorded that The American Psychiatric Association was largely responsible for the elimination of the international psychosis-war.

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GEORGE H. STEVENSON, M.D.

PRESIDENT, 1940-1941

A BIOGRAPHICAL SKETCH

BY CLARENCE M. HINCKS, M.D.

The election of Dr. George Herbert Stevenson to the presidency of The American Psychiatric Association was particularly appreciated by his Canadian colleagues as a recognition of individual merit, and as a demonstration of the splendid spirit of partnership and fraternity that exists between psychiatrists of the United States and the Dominion.

Dr. Stevenson was born in Toronto, Ontario, March 20, 1894, the son of Frederick Yates and Mary Jane Lee. His father had come from England as a boy with his parents; he learned the printing business and settled down in Canada. When George Stevenson was seven years of age, his father moved with his young family to Philadelphia, where they lived for five years. They returned again to live in Hamilton, Ontario. George Stevenson thus received his elementary school education in the United States as well as in Canada. This gave him an understanding of the cultures of both countries, and an interest in international relationships which was reflected in his presidential address.

At the age of sixteen, George Stevenson matriculated with honors. He had set his heart on a career in medicine, but was too young to enter medical school. Accordingly, he decided to work for a couple of years, partly to earn money to defray the costs of education and partly as a means of gaining valuable human experience. He was in turn a shipping clerk, timekeeper and paymaster of a large factory. Later he became a commercial traveller for a lumber company. He sometimes wonders now if the subsequent failure of this company was related in any way to his success as a salesman! This interim of hard work undoubtedly helped him to develop a sympathy, understanding and appreciation of human nature.

His medical education began in 1912 at the University of Toronto, but was interrupted by the World War. In 1915, while completing his third year, he enlisted in the 34th Battalion of the Canadian Expeditionary Force. Transferred later to a stationary hospital, he and three other medical students sailed from Canada in July. This unit finally was stationed on the island of Lemnos near the Dardanelles until the spring of 1916. By this time it became apparent to military authorities that there might be a shortage of physicians and medical students on active service were urged to return to Canada to complete their studies. Consequently, George Stevenson resumed his medical course and graduated in the spring of 1918.

As a medical student, George Stevenson demonstrated good scholastic ability, and was elected to the Alpha Omega Alpha Honorary Medical Society. He was also a member of the Alpha Kappa Kappa Fraternity. Sir Frederick Banting, who was to have been elected to honorary membership in The American Psychiatric Association at the Richmond meeting, was a classmate of our president.

Fate as well as personal inclination played a part in directing Dr. Stevenson's interests toward psychiatry. On graduation in May 1918, he reported immediately to the military authorities for overseas service, but was informed that a military mental hospital had just been opened at Newmarket, near Toronto, and that, because of psychiatric experience gained in student internships in Ontario mental hospitals his services were needed at this institution, operated by the Department of Soldiers' Civil Re-establishment.

While serving on the staff of the Newmarket Military Hospital, he met a nurse in that institution, Olive Agnes Cox, whom he married in April 1919. At that time, since the war was over, Dr. Stevenson applied for an appointment in the Ontario mental hospital service, and in May 1919,

was appointed as junior physician in the Ontario Hospital, Toronto.

His progress in the mental hospital service was rapid. Following a short graduate course at Harvard in the summer of 1920, he went to the Ontario Hospital at London as senior assistant physician. In 1921, he was made assistant superintendent, and concurrently began his teaching career in the department of psychiatry at the University of Western Ontario. In 1927 he was granted a Rockefeller Fellowship for study in Boston and Baltimore, and on October 1 of that year he assumed the superintendency of the newly built Ontario hospital at Whitby where he remained for the ensuing seven years. During this time he developed a twelve-month graduate course in psychiatric nursing—the first in Canada. Because of his interest in psychiatric nursing, he was appointed to the Committee on Nursing of The American Psychiatric Association, and later to the chairmanship of this committee.

At Whitby he took an active interest in the life of the community, particularly as a member of the board of the United Church, as a charter member and first president of the Rotary Club of Whitby, as president of the Ontario County Medical Society and as a directer of the Ontario Ladies College.

In 1934, Dr. Stevenson succeeded Dr. Vroonan as superintendent of the Ontario Hospital at London, and professor of psychiatry at the University of Western Ontario. He still holds these appointments.

Dr. Stevenson's chief psychiatric interests have always centered around the mental hospital. He has been very successful in meeting the challenge of providing better care for the mentally ill. At the same time he has devoted much effort to fostering progress in mental hygiene (especially the development of Ontario's mental health clinic program), to the education of the medical student and of the nurse, to the organization of hospital personnel, to clinical studies and to the compilation of medical history. He has been active in The American Psychiatric Association as a member of the Committee on Public Education, as a member of Council (1936-1939), and as a member and chairman of the Committee on Nursing.

Dr. Stevenson has enriched Canadian psychiatry. His devotion to duty, his humanitarian outlook, his eagerness to understand and serve his patients, his cheerful spirit and loyalty to his colleagues have been priceless assets in hospital administration. He has been markedly successful in developing a fine relationship between his hospital and the community. In London, he has enjoyed the confidence and respect of his fellow citizens, where he is a member of the Harvey Club (medical), a past honorary president of the Osler Society, a past president of the Current Topic Club, and president of the Canadian Club. As a teacher of medical students and nurses, Dr. Stevenson has the faculty of evoking interest in psychiatry and of imparting insights. Although an indefatigable worker, he finds time to play tennis in summer, to curl in winter and to provide camaraderie to his four children—William Herbert, aged 21, who is studying chemical engineering at Queens University; Edward MacLaurin, aged 18, who has entered the medical course at the University of Western Ontario; Robert Harold, aged 15, in high school; and Phyllis Audrey, aged 11.

THE INCIDENCE OF MANIC-DEPRESSIVE PSYCHOSIS IN CERTAIN SOCIALLY IMPORTANT FAMILIES

Preliminary Report[1]

By ABRAHAM MYERSON, M.D., and ROSALIE D. BOYLE

Boston, Mass.

The work, of which this paper presents a part, is divided into three sections: the first starts with socially important families, some of whose members have been known to have appeared at the McLean Hospital, and this particular study concerns itself with the other members of the family group and groups. The purpose of the papers is to discover the social consequences of sterilization and also the possibility of such a procedure.

The second paper starts with a different group of people. It studies the family history of important personages who are not known in advance to have had members at the McLean Hospital or other hospitals, thus acting as a sort of control study to the one here reported. It will appear that there is not much difference in the incidence of mental disease in this group as compared to the first, if the term "family" is extended to include grand-uncles, grand-aunts, first, second and third cousins.

A third study which is now in progress has for its material relatively obscure individuals concerning whose psychiatric family history nothing is known, but who have family trees, so to speak; that is, they are New Englanders concerning whom there are records in their communities which cover a considerable period of time. We are not prepared to make any statement about these individuals at the present time, but their cases will be dealt with in detail in a later paper.

The literature on the heredity of the mental diseases stresses their social and individual liabilities. Charts innumerable have been published and family trees recorded which point out with justified horror and alarm the fact that mental disease appears generation after generation, causes untold social expense, and is an increasing burden of civilized society. However, there have appeared papers and books which indicate that there may be a relationship between mental disease and genius or, at least, high ability.

Lombroso and his pupil Nordau developed this thesis from their standpoint that genius is a form of degeneracy and that the highest intellectual qualities and greatest artistic capacities constitute one end of a chain of deterioration of which mental disease, crime, perversion and idiocy were the middle and the other end. Elsewhere one of us has criticized this theory of polymorphism, as it is called, and there is no need for repeating the objections since it seems, on the whole, to have disappeared from the literature of medicine as a valid opinion. On the other hand, Lange-Eichbaum records more or less objectively that there is a very high correlation between mental disease and great ability, and cites as examples such important personages as Newton, Beethoven, Pascal, Balzac and many others.

The research which is here summarized has no particular axe to grind from the standpoint of eugenics, nor does it attempt to solve the problem of the relationship of genius to mental disease. What will appear, however, is this: that had sterilization procedures of adequate type been carried out in

[1] Read before the Massachusetts Psychiatry Society, April 5, 1940.

Study made by the Committee on Heredity and Eugenics of the American Neurological Association under a grant from the Carnegie Corporation of New York. Members of the Committee: Abraham Myerson, M. D., Chairman; Leo Alexander, M. D.; James B. Ayer, M. D.; Tracy J. Putnam, M. D. Staff: Kenneth Tillotson, M. D., Research Associate; Rupert A. Chittick, M. D., Research Associate; Rosalie D. Boyle, Social Investigator; Mollie S. Levin, Secretary.

Charts made with the collaboration of the Works Progress Administration, Project No. 21176.

the earlier part of the history of New England and of the United States, many highly important individuals and their family groups would not have appeared on the American scene, and consequently, it is very probable that if individuals have anything to do with the development of a country, the development of the country would have been altered; whether for better or worse does not matter so far as this study is concerned. It is, however, important to point out that the "Who's Who" of American development would have been different, and while it cannot be certain that other individuals would not have arisen to take their place, it can be stated that these important personages would not have appeared.

From recent American statistical studies it appears that manic-depressive psychosis is more frequently associated with the more literate and financially independent section of the population than is the case of most mental diseases. I cite Landis and Page [2] in this connection:

> The social status of manic-depressive patients is above that of all the organic psychoses and of dementia præcox. Comparatively few manic-depressive patients come from either the low educational or economic levels. A large number have attended high school and college. The economic status of those admitted to state mental institutions is not of the highest, but this may be due to the fact that the wealthier manic-depressive patients go to the private institutions. This disease is responsible for 16.7 per cent of first-admissions to private hospitals and for only 12.9 per cent of first-admissions to state mental hospitals. The favorable economic level of manic-depressive patients is due to the nature of the disease. Manic-depressive insanity usually occurs after the college age so that it does not seriously interfere with the opportunity for higher education. As contrasted with the apathy of dementia præcox patients, manic-depressive patients tend to be ambitious and energetic. The disease has a good prognosis so that unlike general paresis, alcoholic psychoses, and senile dementia, there is usually no progressive deterioration which affects earnings. Complete sanity is usually regained after an attack. Also favoring the high economic level of the manic-depressive patient is the fact that the onset usually is sudden and there is no prolonged pre-psychotic period with low earning power.

[2] Landis, Carney, and Page, James D.: Modern society and mental disease, p. 64-65. Farrar & Rinehart, Inc., New York, 1938.

Figures from Massachusetts indicate that while, from the social standpoint, the individuals having manic-depressive psychosis are somewhat superior to those who suffer from schizophrenia, the difference is not great, and furthermore, that psychopathic personalities and patients suffering with neuroses occupy a still higher level than do the cases of manic-depressive psychosis.

It is not doubted at the present time that the fundamental basis of manic-depressive psychosis is an inherited constitution. The vast literature on this subject is practically unanimous, although it also appears from certain studies that there probably is an environmental root to the development of this psychosis, although what that environmental root may be no one knows.

We have studied up to now 20 families which may legitimately be called socially important, meaning by this that their members appeared early on the scene of American history and are conspicuous from the standpoint of the accumulation of wealth, the production of men of high social importance, such as high executives of the United States, chief justices, governors, founders of institutions, and men of great renown in poetry, philosophy, psychology and science. One could not write a history of the United States without giving an important place to the individuals of these families.

Fallacy of the Family Name

Here we come, however, to an interesting fallacy—the concept of families as individualized by the family name. Mr. A is not merely a member of the A family. The A *name* comes down on the male side generation after generation, or until such time as the male A's disappear and only the female A's are left to carry on, but the genes come from everywhere. Thus, A always marries a Miss B and their children not only represent all the ancestors of A but also all the ancestors of B, and the final product after generations of mingling is made up not only of A's and B's but of all the letters of the alphabet plus countless permutations of all kinds. It would be impossible to study any single family in a thorough-going way, if this means a complete study of all the

groups which have entered into the composition of any extant single family group. At best, one can only hit the high spots of family relationships, but since this is the way all human eugenic literature has been built up, whatever criticism thus applies to this study must apply to all studies which relate to family groups.

Material

Our studies have started solidly enough with members of these distinguished families who have been at the McLean Hospital. The reasons for this selection are obvious when one considers the fact that this hospital is one of the oldest private hospitals in America; that for over one hundred years it has served one of the oldest English-speaking communities in the western hemisphere; that the psychotic members of distinguished families of New England have found this the most convenient institution for care and treatment; and that the records, while not necessarily extensive or complete, are probably as good as any to be found in the world at the present time. Moreover, the staff of this hospital has been willing and eager to cooperate in the study, and consequently the total set-up for the approach to the problem has been as good as could be found.

While wealth and social distinction do not necessarily go together, they have so high a correlation, either of intrinsic or of coincidental origin, as to justify the selection of the patients of a private hospital rather than those of state institutions for the relationship of social distinction and mental disease.

Misleading Genealogies

It is interesting to note how misleading the genealogies of these important families are so far as the incidence of mental disease is concerned. One can read the elaborate records collected in any genealogical study of a family and not find a single case of mental disease recorded, despite the fact that a dozen or more branches of the family tree have from time to time reposed within hospitals for mental disease. It may be stated without any fear of contradiction that genealogies as a whole stress only assets and very conspicuously and, no doubt, purposely neglect liabilities.

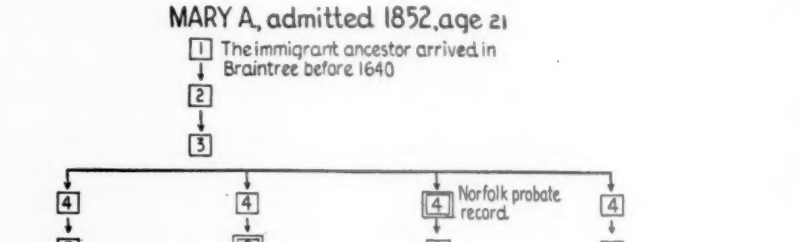
Errors of Omission in Family History

Moreover, it appears very definitely from our studies that the family history, as obtained in any institution, is sadly deficient in so far as it purports to portray the amount of mental disease in the group of which the patient is a member. The first thing that we discovered was that the statement "Family history negative" had fundamentally no meaning, since on many occasions *patients of the same family group had been in the very hospital concerned.* We illustrate this by two charts (I, II) in which the statement "Negative family history" appears concerning a patient at the McLean Hospital, and in which the facts as obtained merely by a survey of the hospital records themselves indicated a definite, in some cases marked, incidence of mental disease in the family group. And this without any study in the community itself, which frequently disclosed court records of psychoses, to say nothing of the concealed nervous breakdowns of the community practice, and not to touch the vast material of the minor sub-depressive and hypomanic states which never come to medical care at all. It appears as a first orientation that until we can get a thorough study of families for generations, we shall have little idea of the extent of the genetic background of mental disease and especially of manic-depressive psychoses. It is our conviction that the larger part of those depressions which are classified as neuroses are manic-depressive in nature.

We believe that it can safely be said that the amount of mental disease in the community and consequently in family histories is far greater than is usually assumed to be the case, and there probably are no negative family histories as far as mental disease is concerned, if one considers such blood relatives as aunts, uncles, cousins of the first and second degrees, to say nothing of grandparents, grand-uncles and grand-aunts, etc.

Intermarriage

The families that we have been concerned with, because they represented the first

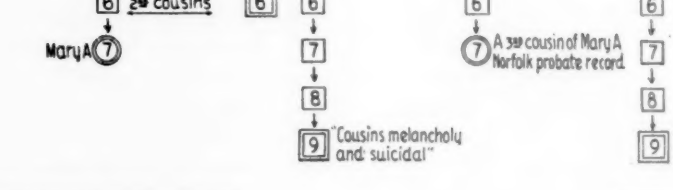


Her record says "Insanity is not hereditary, none of her ancestors on either side having been affected with it."

Comment: Mary's father had a 2nd cousin who had been a patient ten years before her admission and whose record states that his father was also insane. The hospital has had six patients from her original ancestor and Norfolk Probate Court has records of 33 others of the same stock who have been declared non compos mentis in past years.

The double lined individuals are those who had a psychosis.

CHART I.



Her record says: "Her father was nervous but not insane"

Comment: No mention was made of this patient's maternal ancestry but the hospital had nine patients from the same ancestor at the time of her admission. Her mothers own cousin was a patient 12 years before and two of her mother's second cousins also. Jane herself had three second cousins who had been patients.

The double lined individuals are those who had a psychosis.

CHART II.

families, so to speak, of the community, have a high rate of intermarriage. This is a very natural phenomenon and always takes place. People of great importance and ability tend to become socially intimate by a sort of social chemotaxis. There is a strong tendency in human life for caste levels to be developed, even in a democracy. And furthermore, the consciousness of being rich and powerful, as well as an aristocrat, apparently leads to the desire to build up dynasties which shall increase in power and in influence through what is believed to be proper mating and, perhaps more relevantly, the amalgamation of family fortunes.

A very interesting account of this process is presented in Ferdinand Lundberg's book, *America's 60 Families,* in which he points out that "The wealthiest Americans, with few exceptions, are already joined by a multiplicity of family ties, just as they are joined by interlocking directorates and mutual participations in economic and social undertakings." He states that amongst other reasons for this is that the rich are suspicious, when it comes to contracting marriage, of the motives of those who are not rich. They are afraid of fortune hunters. He also lays emphasis on propinquity, but we believe that probably an important factor is the desire for that continued power and prestige which may be called the dynasty complex.

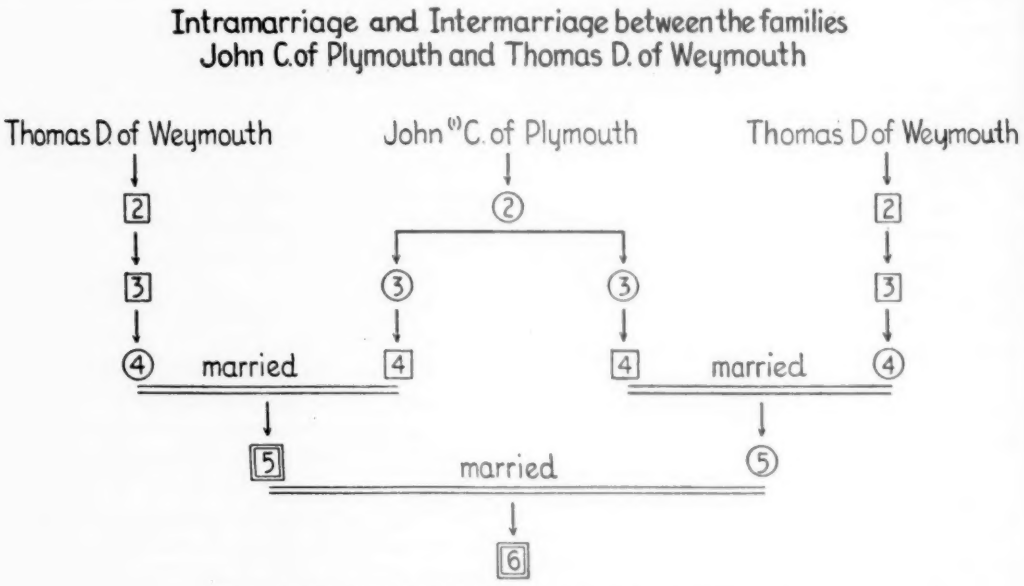
We see in these families not only *intermarriage* but frequently the phenomenon of *intramarriage* of cousins and even double first cousins (Charts III, IV). We thus distinguish in this study between intermarriage and intramarriage. Intermarriage is defined as marriage between two members of non-related families and intramarriage is marriage between two related members, such as two cousins. Now and then, one sees what is equally interesting and significant—of two siblings, one becomes famous and the other remains at a humble cultural level. The man of distinction marries into a family of distinction; the humble brother continues the humbleness of his family line by his marriage and two divergent groups appear, one of which continues to produce distinction, the other to remain amongst the Great Anonymous (Chart V).

Occupation and Profession

If we come to the question of the ranking professions in these families, we find a spread of talent of most significant nature. There have been several governors of Massachusetts. There have been a great many Federal judges, including chief justices of the Supreme Court, numerous members of the Constitutional Congress and of the Senate and House of Representatives which succeed these bodies; Secretaries of State; ambassadors to the great foreign powers; great and significant lawyers; founders of institutions of all types—colleges, churches, business houses of the most significant importance. The people of these families have built railroads, financed and carried through in important measure all of the great enterprises around which American industrial life has been built in the last century. In practically every family, there have been members who devoted themselves to the accumulation of riches in a most successful way, and philanthropists have abounded. Of some families, it may be stated that they were strong on ministers; others produced a prolific group of important judges and lawyers; still others specialized in men of affairs and especially business, accumulating great wealth and achieving importance through their social efforts rather than through any single outstanding achievement.

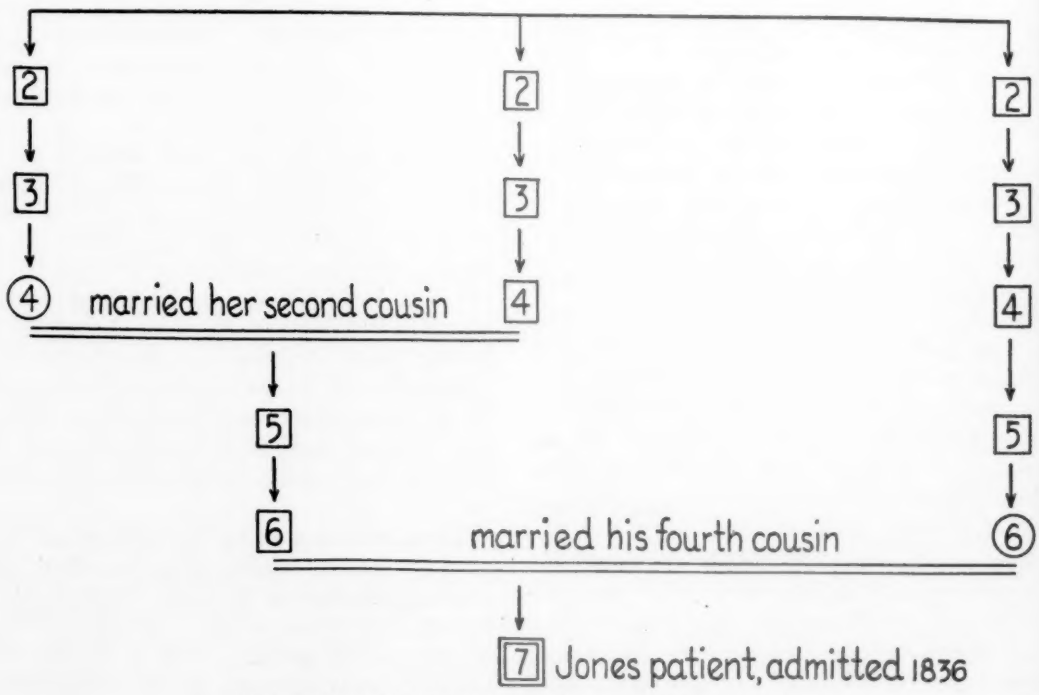
These families have also boasted presidents of the United States, philosophers of international importance, writers who have founded schools of literature; scientists in every field from astronomy to chemistry; medical men galore, around whose names significant developments have clustered. It would be a statistical problem which we omit to list these achivements, since we seek to avoid too direct an identification. What has been said applies so trenchantly as to be without any necessity for statistical corroboration.

Here we come to an interesting and important matter which may be called the social psychology of donation. It often takes illness to turn the attention of philanthropy to any specific project. This is notably the case in mental disease. A very interesting account of this is given in Gustavus Myers'



The double lined individuals are those who had a psychosis.

CHART III.


Intramarriage among the Joneses
John (1) Jones had 3 sons
married her second cousin
married his fourth cousin
Jones patient, admitted 1836

The double lined individuals are those who had a psychosis.

CHART IV.

book *History of the Great American Fortune,* which can amply be corroborated by the donations and philanthropies of the people of our families.

It is interesting to note, however, that there are very few artists in the narrow sense of painters and manipulators of plastic materials. This, however, applies to the whole of American life at this period and up to very recently. Practically no musicians of importance appear in this group. If genius is defined as high and original creative ability, this has not been conspicuous in the families under consideration. They have been developers, executives, accumulators, men of energy and drive, people who avidly plunged into the concrete and profitable, whether of business or science, with only occasional excursions into the imaginative and new. Probably it would be better to speak of this group as people of initiative, courage, enterprise, striking individuality, and social and scientific importance rather than as people of genius.

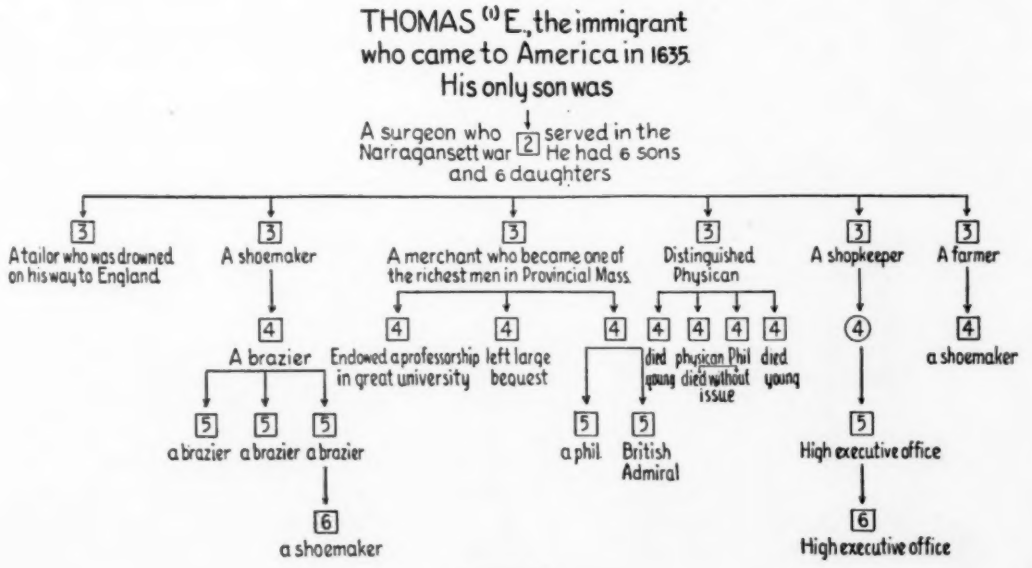

THOMAS (1) E., the immigrant who came to America in 1635. His only son was
A surgeon who served in the Narragansett war [2] He had 6 sons and 6 daughters
[3] A tailor who was drowned on his way to England
[3] A shoemaker
[3] A merchant who became one of the richest men in Provincial Mass.
[3] Distinguished Physican
[3] A shopkeeper
[3] A farmer
[4] A brazier
[4] Endowed a professorship in great university
[4] left large bequest
[4] died young
[4] physican died without issue
[4] Phil
[4] died young
[4] a shoemaker
[5] a brazier
[5] a brazier
[5] a brazier
[5] a phil.
[5] British Admiral
[5] High executive office
[6] a shoemaker
[6] High executive office

CHART V.

TYPES OF MENTAL DISEASE TENDING TO OCCUR IN THESE FAMILIES

In this connection the source of the material must be taken into account. At the McLean Hospital, manic-depressive psychosis is much more common than dementia præcox. This may be due to one of two reasons. In the first place, the diagnosis of manic-depressive psychosis carries with it the idea of recoverability, and consequently people are willing to sacrifice in the sense of undergoing a great expense by sending the family patient to a private hospital rather than to a public institution. Secondly, there is the factor which appears even in the study of state hospital patients; that manic-depressive psychosis tends to occur somewhat more commonly in families of greater intelligence than is the case of schizophrenia. Whatever the explanation may be, at the McLean Hospital over a five-year period (1934 to 1935 inclusive), there have been 235 cases of manic-depressive psychosis as against 80 cases of schizophrenia.

In the Massachusetts state hospitals, a sample year, such as 1938, shows there were 752 cases of schizophrenia admitted as against 400 cases of manic-depressive psychosis, and in general it can be stated that the admission rate of schizophrenia is about twice that of manic-depressive psychosis. In an office practice, such as that of one of us, the proportion of manic-depressive psychosis, especially of the milder types, is five to six times that of schizophrenia. This trend is shown by the fact that even in a state hospital out-patient department, such

as that of Boston Psychopathic Hospital, if one excludes the cases which are reporting after discharge and includes only the new cases, one finds for a five-year period (1935 to 1939 inclusive) 171 cases of manic-depressive psychosis as against 144 cases of schizophrenia.

Since the selection of our group of cases was largely based on the diagnosis of manic-depressive psychosis, it follows quite naturally and expectedly that by far the greatest number of patients that came to the McLean Hospital from these families were manic-depressives, either in the depressed or the manic phase, or at different times in both. Occasionally one finds an epileptic, very rarely a feebleminded person, and now and then a schizophrenic. We have not as yet completed our analysis of the cases on the basis of diagnosis. Of the first six families studied, including 44 patients at the McLean Hospital, 31 had a manic-depressive psychosis, 5 were questionable schizophrenics, and the rest were scattered over a variety of diagnoses.

The question that interests us most, and one which we have not been able to solve except by some degree of inference, is that of the personality types of the successful and important members of the groups who did not come to institutions and who were not out and out cases of mental disease in the institutional sense. We have biographies of certain of these individuals. Thus, in the case of A who was closely related to several of our patients, it is stated:

> Beginning with (a certain date), he seemed like a different man. He plunged into literally a whirl of political activity, revealing a capacity for enthusiastic, persistent and sustained effort that contrasts strangely with his general ineptitude before this date. For this change historical evidence of the documentary sort offers no explanation, but modern psychology does. A series of failures such as he had experienced was practically certain to create in him a pronounced conviction of inadequacy. Naturally the individual wishes to forget his failures; he may ignore them or he may seek to deceive himself and others into a conviction that they represent not weakness but a peculiar virtue. Thus, A boasted to his cousin that "he never looked forward in his life; never planned, laid a scheme, or formed a design of laying up anything for himself or others after him." By professing indifference to the visible symbols of success, to such mundane matters as earning a living, he could get away from the fact of failure.

In the autobiography of one of the greatest of these individuals, we find abundant evidence of recurrent depressions. He had long periods in which he could do nothing, in which he seemed plunged into an abyss of despair; he found no enjoyment in anything in life. He could not plan or foresee. He felt as if his life and all lives were a failure, and from this he would emerge and enter into a period of high creative ability, writing brilliant books and becoming one of the most celebrated teachers of American life.

Another of these celebrated men, brother to one of our patients, reflects this vacillation of mood in his periods of great activity and in his periods in which he complains of sterility and despair. The history of nervous breakdown, lasting for a year or more, occurs quite conspicuously in the life history of many of the successful members.

Sterilization

We finally come to the question, what would sterilization have done if it could have been applied early enough in the history of some of these families? A glance at the charts shows the utter impossibility of carrying out any sterilization process without a blind approach to the problem and without the sacrifice of people who seemed at the time of marriage to be entirely normal.

In the family V, there was a minister who had a brother who was brilliant but eccentric to the point of psychosis. He married a woman who herself was normal and one of 16 children, two of whom appeared to have been psychotic. If sterilization had been done on the individuals of this next generation, two psychotic individuals would have been eliminated from the American scene, patients with manic-depressive psychosis, but there would have gone with them a man internationally known, whose writings still remain as a source of inspiration and life orientation for many people, whose school of thought is still to be reckoned with and who is frequently cited as a figure unique in America and uniquely American. The group who clustered around this man left their influence on the whole of America. His descendants are still extremely eminent and also still send patients to hospitals for mental disease.

Suppose we consider another family line. Two generations before the patients at the McLean Hospital, an immigrant accumulated great wealth in America. He was a man of great drive and intelligence. His son was an intimate of the great literary men of America and England and well known in his own right as lecturer and man of ability. However, the history of his life shows that from time to time he had depressions, and on one occasion the attack lasted two years. He suffered greatly and finally reached a religious philosophy which comforted him a good deal. In the third generation there appeared a patient at the McLean Hospital with manic-depressive psychosis. His two brothers achieved fame of a type which may be described as international in the highest sense of the word, since the writings of both of these men have been translated into all the languages and are quoted as authoritative and historical. In other words, although these men are dead and gone, they are still influential in the world of philosophy, psychology and literature. One of these men graphically describes his own mental periodic illness. On one occasion he was sick five years striving to recover some grip on life. "At this period he was constantly preoccupied with the idea of suicide. Later in life he stated that a man was not psychologically complete unless he had meditated on self-destruction." Words like these carry with them to a group of psychiatrists a clear enough picture of the mental disease from which he suffered from time to time. "After this the universe changed for me altogether. I awoke morning after morning with a horrible dread at the pit of my stomach, and with the sense of the insecurity of life that I never knew before and that I have never felt since. The experience has made me sympathetic with the morbid feelings of others ever since. I have always thought that this melancholia of mine had a religious bearing. The fear was so invasive and powerful that if I had not clung to texts like 'The eternal God is my refuge' and 'Come unto me, all ye that labor and are heavy laden,' I think I should have grown really insane." It is stated he had other breakdowns and periods of nervous exhaustion. This man emphasized that there was no sharp line between healthy and unhappy minds and that people who had nervous burdens to carry, hereditary perhaps, could order their lives fruitfully and derive some gain from their degenerate sensitiveness.

Whom could we have sterilized in this family line to prevent the manic-depressive state and at what cost of social riches, in the truer sense, would this have been done?

Let us take, for example, another family, the K family. This brilliant family has contributed most heavily to American politics, medicine, industry, and especially to American law. In many respects the intelligence represented in this group is as high as that of any family in America, yet this family, or rather families, has sent more patients to the McLean Hospital than any other of the groups we have studied. At least 16 members have been at the McLean Hospital. Many more have been adjudged mentally sick without being committed, and there is no way of knowing how many other members have been in other institutions, since the family name is quite common. It can be said that any attempt to eliminate this stock by sterilization would have altered the personnel of the great courts of America in amazing fashion, and in addition would have deprived American medicine of at least one of its most shining lights.

In fact, what can safely be said is that a sterilization process would have had to have been ruthless and indiscriminate to have reached and eliminated the psychotic members of these family groups. This would have been accomplished at the sacrifice of people who can only be classed as of the highest grade, next to genius, and in the case of some, absolute genius, using this word in its most exclusive sense.

It is true that something of the same objection may be made to birth control techniques. A survey of the world's literature would easily show many very distinguished persons who were the 5th, 6th, 7th, 8th, 9th or 10th members of their sibling families. This means, of course, that had birth control methods been used at that time, these individuals would not have appeared, and consequently birth control could be shown, on the same basis as the argument used in this paper, to be against certain desirable

interests of the race in that it eliminates or prevents from appearing distinction and genius. Certainly any technique which prevents a wider variety of human beings would seem *a priori* to be against the appearance of the variants from the average, and this would apply as cogently to genius as to the abnormal human types. The argument that sterilization might cut off genius and high ability applies equally well to birth control, the difference, of course, being that birth control does not exclude a line from *any* expression in the matter of reproduction while sterilization does.

It does not necessarily follow that the individuals who appear in these records were great because they had mental disease, although that proposition might be maintained with considerable cogency and relevance. It may be that the situation is more aptly expressed as follows. The manic drive in its controlled form and phase is of value *only* if joined to ability. A feebleminded person of hypomanic temperament would simply be one who carried on more activity at a feebleminded level, and this is true also of mediocrity, so the bulk of manic-depressive temperaments are of no special value to the world, and certainly not of distinguished value. If, however, the hypomanic temperament is joined to high ability, an independent characteristic, then the combination may well be more effective than the union of high ability with normal temperament and drive might be. The indefatigability, the pitch of enthusiasm, the geniality and warmth which one so often sees in the hypomanic state may well be a fortunate combination and socially and historically valuable.

The same is true when we consider the depressions. In their milder forms, one is almost inclined to say that some of the insight manifested in the writings of people in what might be called the morbid state of mind, so far as depression is concerned, springs from the fact that they become self-searching, brood on the meaning of life—a brooding in which the healthy mind indulges only occasionally and even then only when thrown back on itself. United with this ability, this brooding may produce poetic, philosophic and religious insight and manifests itself in words which influence the minds and the life goals of posterity. Goethe once said this in immortal terms,

"Wer nie sein Brot mit Tränen ass,
Wer nie die kummerreichen Nächte,
Auf seinem Bette weinend sass,
Der kennt Euch nicht Ihr himmelischen Mächte."

Perhaps the words of Bumke need to be taken into account before we embark too whole-heartedly on any sterilization program, "If we could extinguish the sufferers from manic-depressive psychosis from the world, we would at the same time deprive ourselves of an immeasurable amount of the accomplished and good, of color and warmth, of spirit and freshness. Finally only dried-up bureaucrats and schizophrenics would be left. Here I must say that I would rather accept into the bargain the diseased manic-depressives than to give up the healthy individuals of the same hereditary cycle."

This may be an over-statement and very likely it is. The problem can by no means be solved at the present time. However, we feel inclined to add this thought to the whole situation. It may be that adjustment to a psychopathic society requires some degree of psychopathia; that success in a world which sacrifices biological drives and which demands of the human being a self-pruning which may injure vital functions is not necessarily achieved by the normal; and that abnormal qualities and even abnormal states of mind may have value in our abnormal society. This is a fruitful and prevocative thesis which need not be developed further in this paper.

We may summarize this paper somewhat as follows. A study of distinguished American families reveals a great deal of mental disease, if the term *family* is extended to include cousins to the third and fourth degree, uncles, aunts, grand-parents and great-grand-parents. The term *family* in such cases is, of course, a misnomer largely brought about by the use of the male name generation after generation. Sterilization procedures would have deprived America of some of its most notable figures. This does not mean, of course, that the history of the country would necessarily have been different in any extraordinary way since there is always a pressure of individuals seeking

to obtain the highest places, one of whom succeeds; but if he were not there, someone else—probably as competent—would have occupied his position.

It is probable that the warmth and insight of the cyclothymic temperament plays some role in achievement, but only as a variant added to ability rather than as a cause of ability, because there is probably no significant difference between the incidence of mental disease in the high-placed and the low-placed of human affairs, as we shall show in a later paper.

In the ever-present admixing of family stocks which goes on by marriage and which has a higher incidence in small and successful groups, there is a factor of great importance, but its range and intensity of operation cannot be discovered by studies of this kind. It would require an institute for genetic research, established for at least one hundred years, to collect in real scientific manner the records of human beings in order to reach those conclusions necessary for an understanding of the inheritance of mental disease.

For obvious reasons these cases are not discussed in great detail nor have we shown charts which would be of identifying nature. Complete charts are on file, however.

THE HEREDITARY FACTOR IN MENTAL DEFICIENCY[1]

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While it has been recognized for many years that mental deficiency may be inherited, it was not until 1883 that the subject of eugenics was first defined by Sir Francis Galton. There immediately followed a period, which has been termed by Davies the period of eugenic alarms. The "royal families" of the feebleminded were studied and their pedigrees published in detail, families such as the Jukes, the Tribe of Ishmael, the Zero Family, the Nam Family, Dwellers in the Vale of Siddem, and finally, the now famous Kallikak Family. Goddard stated that "feeblemindedness is inherited and is transmitted as surely as any other character." Davenport, in 1911, was the first to make a statement on the inheritance of mental deficiency in terms of the Mendelian theory. According to Myerson, these studies were motivated, not so much by a strict scientific spirit, as by a desire to benefit the race, which was in danger of being swamped by the feebleminded and the low grade. During this period permanent segregation or sterilization were offered as a panacea to combat and obliterate the entire problem.

Myerson feels that much of this material has been invalidated and should be relegated to history. In the first place, while much of it may be true, it does not represent the great mass of the feebleminded, but only isolated groups. Myerson severely criticizes the validity of the evidence. He ridicules a field worker who is able to pass judgment on an individual who has been dead for three or four generations and about whom no authentic information could possibly be obtained. They have made diagnoses of syphilis on individuals two or three generations back, individuals whom they have never seen, while modern syphilologists make such a diagnosis only after careful physical and serological examination.

About 1925, however, the general opinion began to undergo a gradual change, so that views on the significance of heredity became much more conservative. Previously, 80 to 90 per cent of feeblemindedness had been considered hereditary. Fernald, at the Waverly State School in Massachusetts, and one of the most distinguished students of the subject, found that fully half of all his cases could not be considered hereditary. Potter, at Letchworth Village, reached the same conclusion, while Myerson and Elkind, as a result of their combined studies at Waverly and Wrentham, found that the proportion was even less than half.

Dayton found that the type of material studied was an important factor. After examining 3553 retarded school children, 72 per cent of whom were feebleminded, he found roughly twice as much mental deficiency in the heredity of the institutional group as in the public school cases.

More recent studies in Germany, Sweden and Denmark have shown considerable evidence that mental deficiency is inherited, though the figures vary according to the thoroughness of the investigations.

Recent studies in Great Britain also vary greatly in their results. Berry and Gordon believe that 80 per cent of mental deficiency is inherited. Gates also concludes that it is mostly of the inherited type and that the inheritance is usually recessive. The general opinion in Great Britain may be summed up in the words of the Report of the Departmental Committee on Sterilization. Among other important conclusions this report

[1] Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

states: "It is impossible in the present state of our knowledge about the causation of mental defect to forecast with certainty whether a child of any given union will exhibit mental abnormalities. It can, however, be shown that, whether the cause be bad heredity or adverse environmental conditions, or both, the children of parents, one or both of whom are feebleminded are, on the average, below the normal, and our enquiry shows that nearly one-third of such children as survive are likely to be defective, and more than two-fifths must be expected to show some degree of mental abnormality."

Probably the most recent thorough study is that by Penrose who made a clinical and genetic study of 1280 cases of mental defect, publishing his results in 1938. He found considerable evidence of heredity and analyzed his material in many interesting ways but arrived at no special conclusions.

In recent years there has been a strong tendency among students and critics of this problem to reject any or all evidence which is not based upon actual psychometric tests or measurements, or upon actual psychiatric examination or observation by qualified examiners. The difficulty of adhering to such a rigid standard is obvious. Mental tests were not introduced into this country until 1912, and it was several years before they came into general use. It is therefore impossible to find any record of a mental test on individuals who died prior to 1912. Even in old institutional records of patients who have died or left the institution prior to 1912, there is little to indicate the mental level of the patient. In the records of hospitals for mental diseases, before the introduction of the standard classification of mental diseases by The American Psychiatric Association, we find such indefinite diagnoses as mania, depression, melancholia, etc., terms which do not indicate any definite clinical entity. Sometimes only an indefinite cause is ascribed, such as menopause, sunstroke; even masturbation comes in for its share of the blame.

Our study of this subject has progressed intermittently for more than five years. Our first publication, which was merely a brief report of our early progress, appeared in the Bulletin of the Managing Officers Association in 1936. We have continued the work and have attempted to adhere to the standard mentioned above. The mere statement in the family history that an individual is mentally defective is not accepted without corroborative evidence. If an individual has been a patient in an institution we have endeavored to verify the fact and record the diagnosis. Individuals who have never been patients in institutions are not classified as mentally defective unless adjudged so by a probate court, or unless there is a record of a mental test or an examination, or unless the statement is based on satisfactory evidence, such as retardation in school. Our efforts to verify the statements that certain relatives of our patients have been in institutions have been very discouraging. In many instances, in spite of accurate names and dates, the records could not be located. In many instances the name of the relative is not given; the record may still be found but it is usually impossible in female relatives whose names change by marriage or in maternal relatives where the family or maiden name is not given. Old state hospital records are sometimes in such shape that records cannot be found even when an index card appears in the files.

We have more than 300 cases in our material containing such statements which could not be verified for one reason or another. But in spite of these difficulties we have continued with the work. It is very difficult, tedious and time consuming, but it becomes clear as the work progresses that the more thoroughly our family histories are studied, more and more evidence accumulates to indicate a definite hereditary factor. Our work is by no means completed but we are now ready to render a report of our progress.

Our material consists of all the facts contained in the patients' records at the Institutions for Feebleminded at Orient and at Columbus. More than 10,000 such records have been examined. We have also examined the commitment or application papers in 3000 additional cases, adjudged mentally defective by the courts but never admitted to institutions. Our material has been further supplemented by examination of the records of Ohio state hospitals to which we are indebted for much valuable material.

In collecting this material for analysis we have rigidly excluded all instances of cretinism, mongolism, post-infectional or post-traumatic conditions where the mental defect depends upon a definite pathological basis. All instances of congenital syphilis have been excluded, as well as paresis and other forms of syphilis of the nervous system. Alcoholism, delinquency, drug addiction, deaf-mutism, rheumatism, cancer, apoplexy, etc., which, in older studies were thought to be of importance, are not now considered of any significance.

Thus far we have collected material in 1765 families. In 821 of these families the evidence is limited to one generation only.

TABLE 1

EVIDENCE LIMITED TO ONE GENERATION—821 FAMILIES

	Siblings	Cousins	Total
Mentally defective at inst. for feebleminded	1,353	25	1,378
Mentally defective, not in institutions	347	2	349
Epileptic in institutions	17	4	21
Epileptic, not in institutions	61	31	92
Insane, at state hospitals	27	9	36
Insane, not at state hospitals	4	0	4
Total	1,809	71	1,880

In 827 families the evidence was confined to two generations. In 114 families three generations were involved. We were able to collect only four families in which mental disease could be traced to the fourth generation.

Table 1 shows in a condensed form the evidence which is limited to one generation. In 821 families there were 1880 siblings or cousins who were mentally defective, epileptic or insane. Of this number 1435 were patients at some institution and the diagnosis could be verified. The diagnosis of the remainder has been verified either by actual mental tests, by other satisfactory evidence or by personal observation, or they have been adjudged mentally defective by a county probate court. Instances in this group are constantly being transferred to the two generation group as our knowledge of the parents accumulates.

Table 2 is a brief tabulation of the essential facts gathered from 827 families in which the evidence was confined to two generations. Mental deficiency occurred in one or both parents in 317 families. In 63 families both parents were mentally defective, and in 5 of these families both parents were confined to institutions. Mental deficiency could be established in one parent in 254 families, exactly half of whom were confined to institutions. Psychoses in parents occurred in 203 families, both parents being affected in 4 cases and one parent in 199.

TABLE 2

EVIDENCE CONFINED TO TWO GENERATIONS—827 FAMILIES

	No. of families
Mental deficiency in parents and children	317
Mental deficiency in both parents	63
Both parents in institution	5
Neither parent in institution	58
Mental deficiency in one parent	254
Parent in institution	127
Parent not in institution	127
Psychoses in parent with mental deficiency in children	203
Both parents psychotic, in state hospitals	4
One parent psychotic, in state hospitals	199
Epilepsy in parent with mental deficiency in children	109
Both parents epileptic, not in institution	4
One parent epileptic, in institution	11
One parent epileptic, not in institution	94
Mental disease in uncles or aunts with mental deficiency in nephews or nieces	198
Total uncles or aunts in institution	106
Total uncles or aunts not in institution	152

Epilepsy occurred in one or both parents in 109 families. Mental deficiency occurred in collateral relatives such as an uncle or aunt in 198 families.

As shown in Table 3 there were 1161 mentally defective children, 882 of whom were patients in institutions. There were 215 other relatives who were mentally defective, epileptic or insane. In the 827 families there were 2334 individuals who were mentally defective, epileptic or insane, of whom 1469 were patients in institutions.

We consider Table 4 a very significant bit of evidence. In 115 families, either one or both parents and one or more children were mentally defective, the diagnosis having been

verified by actual institution records. In 10 of the families, in addition to the parents and children, siblings of the parents were also patients in institutions.

Chart 1 is an excellent example of this type of family. Three children, their mother and three of her siblings are mentally defective, all of whom are patients at institutions for feebleminded. There is presumptive evidence of mental deficiency to the third and fifth generation, but there is no support of this evidence except the bare statement.

Chart 2 shows 6 mentally defective children who, with their mother, are all patients at institutions for feebleminded. While the father has never been tested he is known to have been an alcoholic, shiftless man, who was seriously retarded in school and has never been able to support his family. Two paternal uncles of the children have been patients at a state hospital, one of whom had manic-depressive psychosis. The other uncle and the paternal grandfather died at state hospitals, one of senile psychosis and the other of psychosis due to organic brain disease. The latter diagnoses are not considered significant from an hereditary standpoint, and the evidence is therefore limited to two generations.

Table 5 is a brief summary of the evidence of heredity in 114 families in which three generations were involved. Both grandparents and both parents were mentally defective in 6 families.

Table 6 is a further analysis of the evidence in the three generation group. In 114 families there were 256 mentally defective individuals, 90 who were epileptic and 52 who were insane. There were a total of 398

TABLE 3

EVIDENCE CONFINED TO TWO GENERATIONS—827 FAMILIES

Children of mentally defective, psychotic or epileptic parents		1161
Children in institution	882	
Children not in institution	279	
Other relatives mentally defective, psychotic or epileptic		215
Other relatives in institution	126	
Others not in institution	89	
Total number of individuals of two generations with mental deficiency, psychoses or epilepsy		2334
Total in institution	1469	
Total not in institution	865	

TABLE 4

PARENTS AND CHILDREN AT INSTITUTIONS FOR FEEBLEMINDED

Mother and one child, both at institutions	68
Father and one child	2
Mother and two of her children	18
Father and two children	1
Mother and three children	5
Mother and four children	4
Mother and five children	2
Mother and seven children	1
Mother, her siblings, and one child	6
Father, his siblings, and one child	1
Mother, her siblings, and two children	1
Mother, her siblings, and three children	2
Both parents and one or more children	4
Total	115

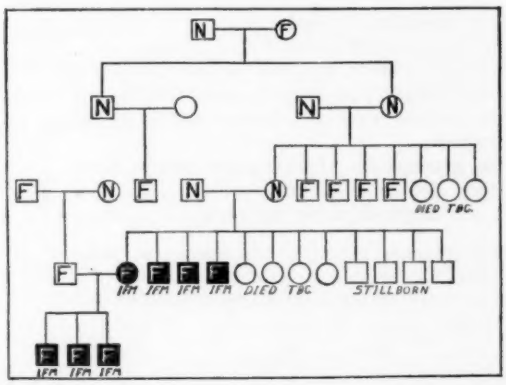

CHART 1.—Positive evidence of mental deficiency in two generations.

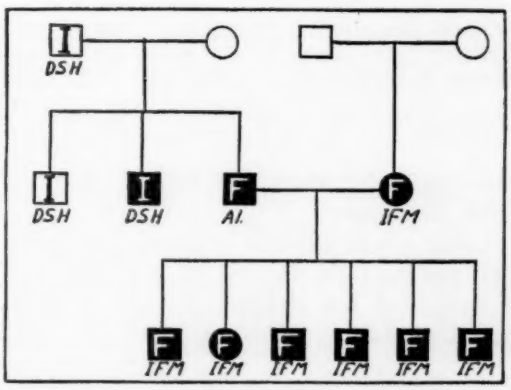

CHART 2.—Positive evidence of mental deficiency in two generations.

TABLE 5

EVIDENCE OF HEREDITY IN THREE GENERATIONS—114 FAMILIES

	No. of families
Both grandparents and both parents mentally defective	6
One grandparent and one parent mentally defective	14
One grandparent alone mentally defective	2
Great uncle mentally defective	2
Both grandparents epileptic	1
One grandparent epileptic	42
One grandparent and one parent epileptic	11
One grandparent and uncle or aunt epileptic	3
Great uncle epileptic, parent mentally defective	1
One grandparent epileptic, one parent mentally defective (direct)	4
Cousin of grandparent epileptic	1
One or more grandparents insane, at state hospitals	18
One grandparent insane and one parent insane	7

feebleminded. The father of these children, the mother of the cousin, both paternal grandparents in one line and the maternal grandmother in the other, as well as an aunt, are all mentally defective. This has been verified from evidence obtained from the matron of the county infirmary who observed them over a period of many years in her institution.

Chart 4 is another example of the three generation group.

We have made no attempt to tabulate the information obtained from the 4 generation families. Chart 5 is our best example. The child is an imbecile in an institution, and her mother and a maternal aunt are likewise. The grandmother and her brother are both patients at a state hospital with a diagnosis of mental deficiency with psychosis. Nothing definite is known of the great grandmother

TABLE 6

EVIDENCE OF HEREDITY IN THREE GENERATIONS—114 FAMILIES

	Grandparents		Parents		Children		Others		
	In	Out	In	Out	In	Out	In	Out	Total
Mentally defective	5	23	10	21	116	33	15	33	256
Epileptic	3	59	0	11	0	0	0	17	90
Insane	23	7	11	1	0	0	5	5	52
Total	31	89	21	33	116	33	20	55	398

individuals, of whom 188 were patients in some institution.

Chart 3 is an example of the three generation group. Two children, their mother and a cousin of the children are all mentally defective and are patients at institutions for

but she had a sister who was a patient in the same hospital with a diagnosis of mental deficiency.

Table 7 shows the mental status of 2724 mentally defective individuals in all groups. The preponderance of morons and imbeciles

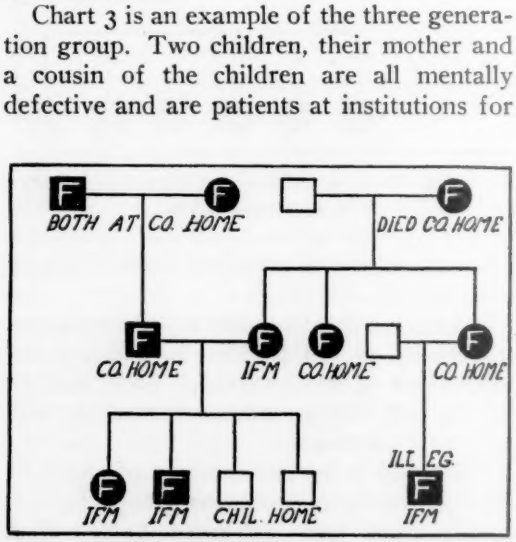

CHART 3.—Positive evidence of mental deficiency in three generations.

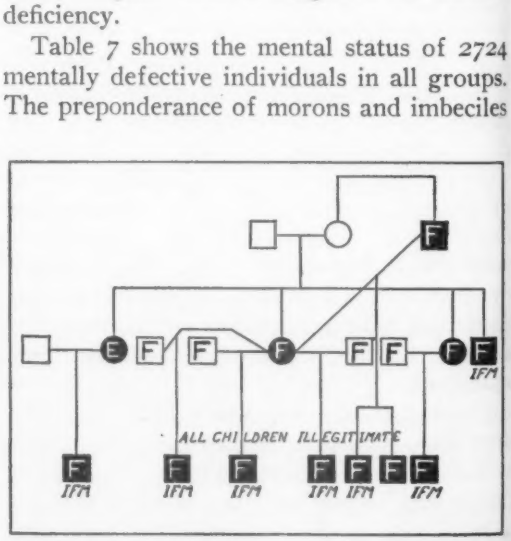

CHART 4.—Positive evidence of mental deficiency in three generations.

and the relative scarcity of idiots is in agreement with the general idea that the great majority of hereditary mentally defectives fall in the moron or imbecile group. In this study 85 per cent of the cases, in which the mental status was definitely known, were morons or imbeciles.

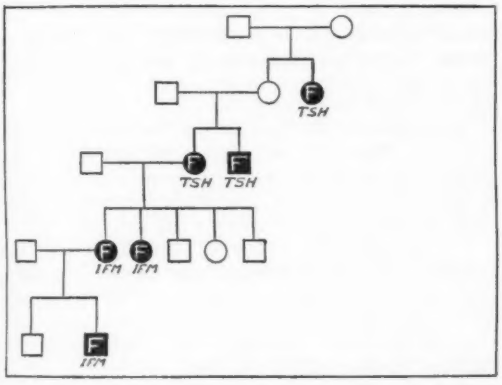

CHART 5.—Positive evidence of mental deficiency in four generations.

TABLE 7

CLASSIFICATION OF MENTALLY DEFECTIVE INDIVIDUALS

		Per cent
Moron	1319	48.4
Imbecile	1017	37.3
Idiot	227	8.3
Subnormal (I.Q. 70-80)	161	5.9
Total	2724	

Table 8 shows the diagnoses in 274 individuals where the type of psychosis is known. While this question has not been settled, we believe that the preponderance of dementia præcox, manic-depressive psychoses, together with mental deficiency with psychosis, is very significant, constituting 60 per cent of the cases. The great majority of these cases occurred in parents.

At this stage we are not prepared to make any far-reaching conclusions, and we have not attempted to make any theoretical deductions. If the unsupported statements appearing in the family histories of our patients are accepted at face value, we would be safe in assuming that 50 per cent of our cases can be attributed to heredity. If all the evidence which cannot be verified is discarded, the proportion is considerably reduced, probably to 25 or 30 per cent. It is quite true, however, that as the study progresses, more and more evidence is accumulated which can be verified. In recent years, especially in the large cities where sociological, psychological and psychiatric consultations are quite readily available, more accurate information, based on examination, is appearing in our records. A social worker, trained in psychology and prepared to do psychometric examinations has been recently added to our staff. She is already beginning to bring in valuable information.

TABLE 8

CLASSIFICATION OF PSYCHOTIC INDIVIDUALS

		Per cent
Dementia præcox	89	32.4
Mental deficiency with psychosis	33	12.0
Manic depressive	44	16.0
Paranoid	14	5.1
Mania	11	4.0
Involutional melancholia	16	5.8
Psychopathic personality	7	2.5
All others	60	21.8
Total	274	

In closing we wish to stress the importance of careful family histories. The mere recording that a relative is mentally defective, epileptic or insane is not sufficient. The name of the relative, especially of females, should always be recorded; if the relative has been a patient in an institution, the name of the institution and the approximate date of admission should always be included, so that the information can be verified. The new addition to the Ohio commitment papers, in the form of a case history, devised by our Commissioner of Mental Diseases, is a very important contribution to the records. If carefully filled out, these papers cannot help but improve our knowledge of this subject.

DISCUSSION

DR. JOSEPH G. WILSON (Frankfort, Ky.).—Although Dr. Kirk, Dr. Hopwood and Dr. Keiser have stressed the importance of heredity, they have also added more evidence to support the ever-growing conviction that heredity is not the overwhelming factor in the etiology of these cases which we once believed it to be. But it is interesting to note that they still believe it is a factor and that 50 per cent

or possibly 35 per cent comes nearer to being the right figure than the 80 or 90 per cent as we thought in the days of Goddard, back in 1912 and until about 1925, when opinion rapidly began to swing the other way.

I remember very distinctly at Ellis Island in 1912 or 1913, Dr. Goddard who had been doing Binet tests on his cases at Vineland for a year or two previously, was very much impressed with the idea that we were allowing thousands of immigrants to come into the United States who were definitely feebleminded. With the cooperation of the chief medical officer at Ellis Island Immigration Station and his staff, Dr. Goddard and some of his co-workers stood and watched the line of immigrants come in, and as they came by, in a casual talk on the line they believed they would be able to pick out from that line a large number of persons that we were missing.

Well, they stayed there about a week, when they had to admit that they were mistaken, that although we undoubtedly were missing many, they were picking out a great many who they believed would not pass a normal test but who did pass such a test very well indeed.

If I interpret Dr. Kirk's paper correctly, his tables and charts indicate that the evidence for heredity, being a decided factor in about 35 per cent of the cases, grows progressively stronger as it includes data for more than one generation. In other words, the farther back we go into the ancestral history of a feebleminded case, the more feebleminded, epileptic and psychotic relatives we unearth; but would the same not be true of any normal family? If any of us went deeply into the family history of our forebears, I fancy we would find that we, too, have a large number of feebleminded genes in our germ-plasm.

This raises the question as to what is the factor after all which is really inherited. Is it a physical defect in the germ-plasm, or is it simply the handing down of bad family customs and poor economic conditions from father to son, or is it sometimes one and sometimes another? In this connection, I remind you of Professor Jennings' statement that the environment of today is the heredity of tomorrow.

Dr. Leonard Dub (Columbus, Ohio).—Intelligence is rather an abstract quality that does not lend itself easily for measurement. I am afraid we are apt to be a little oversold on the so-called results of intelligence tests. Intelligence can be divided roughly into three types—the abstract type, the non-verbal, mechanical or performance type, and an even more vague type, social intelligence. It is the latter that is the most important. A person does not get into a feebleminded institution because he does not get along in school or is unable to fix his automobile; it is because of his inability to make adequate adjustment in civil life, when he comes into conflict with law, and eventually ends up in one of these institutions.

The element of race has not been properly considered. Those of us who work with this type know that there are certain races that are more predisposed to show a limited intelligence and yet made a very adequate adjustment in civil life.

It was only about five or ten years ago that epilepsy was considered more or less of an entity, and 80 per cent of epilepsy was called idiopathic. With present methods of investigation not more than 20 per cent of epileptics are considered idiopathic. Feeblemindedness, also, is not a distinct entity.

We have no good tests for social intelligence. The Vineland social maturity test, which is so often used, does not lend itself for older groups. We need some more adequate test for evaluating this particular aspect of intelligence.

Dr. Arthur T. Hopwood (Orient, Ohio).—It is impossible to say at this time what the specific defect is and how it is transmitted. The eugenist will probably say that it is a specific character transmitted according to Mendelian recessive functions. The sociologist may say that it is a normal variation due to defective stock or diseased germplasm. We are not yet able to state what the particular mechanism is.

Our work is continuing, but it will require the combined efforts of all institutions and all workers in this field to collect and assemble and combine the information from the entire field if we are ever to arrive at any satisfactory solution to this problem.

THE PSYCHIATRIC CLINIC AND ITS RELATION TO THE COMMUNITY[1]

By SPAFFORD ACKERLY, M. D., Louisville, Ky.

Modern public health, of which we proudly boast, keeps more babies alive—to reach adolescence, middle age and old age. Whether these older people are glad that they are born, whether they view their lives with satisfaction or chagrin, whether society is grateful for their sojourn here, is of concern to every community. How in the long run to get the most efficiency and happiness out of the human organism and how in the shorter run perhaps to guide existing drives and encourage the dormant ones into fuller expression, how to compensate more effectively when thwarted so as not to overtax one's psychophysical means or overstep the tolerance of society, is of concern to each individual.

The five billion dollar annual crime bill, the billion dollar economic loss from mental illness to say nothing of the cost of caring for the criminal, the mentally ill, and the human suffering involved, are startling enough. However, such costly breakdowns are small in number compared to those whose lives are unproductive, inefficient and lacking in morale and social usefulness. Then there is the man who works but is unhappy in his job, like the taxi-driver who once said to me, "I get out of my prison on wheels only to eat and sleep. There's more fun in jail." Finally, it is impossible to estimate the number of outwardly adjusted but inwardly unadjusted people in a community. And here, of course, is where psychiatric education is most needed because so many of these people are not only potentially adequate, but many have achieved a position of influence in the community.

The importance of tackling these problems in childhood is generally considered paramount to that end.

The Commonwealth Fund in 1921 undertook as a five-year program the study of behavior problems of children, most important of which was delinquency. The purpose was to determine how the "technical knowledge of the psychiatrist, psychiatric social worker and psychologist could best be utilized as a community asset in the study of behavior problems in children and of conducting demonstration child guidance clinics in a series of selected cities." In that study dealing with childhood where emotional habits are in the process of formation and personality as yet unfixed, the study was focused on those factors both within and without the child which are determining its unhealthy and unsocial reactions.

In 1926 the Commonwealth Fund announced the establishment of the Institute for Child Guidance in New York City as a result of the experience gained during the five-year program. Four major objectives were established, namely:

(1) Further study and research in methods of treatment of behavior problems of children.

(2) Provision for clinical experience and practical training in the organization and operation of child guidance clinics.

(3) Provision for field training for student psychiatric social workers.

(4) Provision for adequate clinical facilities for the thorough study and treatment of a selected group of problem children.

Since 1926, other privately endowed psychiatric clinics have been established, but for the most part community chests throughout the country have rightfully led the way in developing community psychiatric clinics as training and service centers.

Time does not permit even a hasty historical glimpse of all the important centers in this country. However, the splendid contributions that were made through the years by Dr. William Healy at the Institute for Juvenile Research in Chicago and later at the Judge Baker Foundation in Boston are known to all. The evolution of his thinking would carry one through the various stages of the development of child guidance work in this country.

[1] Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1941.

We could also do well to follow the thinking of Dr. Lawson G. Lowrey, first as director of the demonstration clinic in Dallas and Minneapolis and later as director of the Institute for Child Guidance in New York City. It would be very gratifying to outline the growth of the Philadelphia Child Guidance Clinic under the able direction of Dr. Frederick Allen and compare his thinking of today with that of yesterday. There are others that have done outstanding work, but time does not permit continuing the list.

Most of us can remember the era of voluminous records. It was a stage of groping for goals in treatment and filling in the gaps by recording accurately all the conversations with the child, the relatives, school teachers and others. Each patient went through the rigid clinic routine regardless of his individual needs.

Out of this mass of data came the urge to *do* something, and the era of manipulation therapy was ushered in. A clinic director's ability was judged by his resourcefulness in dictating long lists of recommendations for others in the community to carry out. When purely environmental manipulation proved disappointing, good environments were sought and children removed to them. Excellent results were achieved and in some instances maintained even after the child returned to his old environment. But modification of parental attitudes by authoritative methods was found to be exceedingly difficult, and eventually a reaction against environmental therapy set in and one brand or another of psychoanalysis quite as enthusiastically centered all attention on the individual's endo-psychic conflicts.

Out of all these valuable contributions has come a healthy eclecticism of approach to the patient and the world in which he lives. At last the *person* as a functioning unit in society and not his symptoms has taken the center of the therapeutic stage and the therapist, no longer a stage director, participates in the performance to the extent to which he is invited by the patient. More and more attention is being focused on the person to person relationship in therapy, utilizing of course the contributions of the past.

When one considers the increase in the number of psychiatric clinics in this country since the last World War—clinics dealing primarily with children—there is no doubt as to just how keenly the public feels concerning the prevention and treatment of maladjustment. In 1919 there were only two full time and five part time child guidance clinics. In 1921 the Commonwealth Fund established two full time demonstration clinics. In 1926 there were over fifty full time clinics and thirty part time clinics. At present there are over a hundred such clinics in this country, as evidence of a growing confidence in mental hygiene.

The psychiatric clinic of today is still very young. Its real value to the community rests ultimately in the techniques it may develop and perfect for helping individuals to want to face their problems and do something about them. The value of a psychiatric clinic or of any organization attempting to do such work should be judged not on a premature evaluation of immediate results, but on whether it is striving to perfect therapy techniques. The task of clearly defining exactly what this person to person, patient to therapist relationship is at its best, at its worst, and all the way in between is indeed a formidable one.

This is hardly the place to enumerate the manifold services rendered the community by the average psychiatric clinic, for these are well known. Some clinics in large cities can be more selective than others in the type of patient they receive because there are other psychiatric resources available. The trend in general is away from isolated clinics to the centralization of all psychiatric service, since the effectiveness of the whole is greater than that of isolated units. Experience shows that greater service can be rendered the community if the psychiatric clinic service can be affiliated with a city's medical center, especially where there is also a university and a school of medicine. Not that the psychiatric clinic cannot function independently, as any private psychiatrist must do—indeed the patient to therapist relationship could be had in the backwoods—but just as the social agencies in any city feel a sense of security when they are able to turn over their emergency and baffling cases

to a psychiatric clinic, just so is there a sense of security for the psychiatric clinic in knowing that it can turn over mental and psychosomatic cases to other divisions of a medical center. Here patients will receive proper consideration without delay in respect to modern aids in diagnosis, such as air studies of the brain, electroencephalography, psychosomatic studies and a variety of therapies.

From the medical center's point of view, the psychiatric clinic constitutes its therapeutic laboratory for the training of its hospital staff in intensive psychotherapy, with emphasis always on prevention. By virtue of the close affiliation of the psychiatric clinic with all the social and welfare agencies in the community, the medical center is made more conscious of its responsibilities to the community. Doctors made or in the making are usually better doctors if they are conscious of the social welfare needs of the community and the philosophy of social work in general. The psychiatric clinic's chief responsibility, however, is to develop techniques for the treatment of the individual patient. To the extent that this is done and can be passed on to others, to that extent only will it continue to make a distinct contribution to all other disciplines dealing with human beings.

Naturally a psychiatric clinic has many other duties to perform. It should interpret to the community the community's own responsibility in regard to the offenders against society. Too often a judge in a juvenile court will want to use the clinic as an arm of the law. I have known a judge to telephone the clinic during a hearing with the parents of a delinquent boy standing in front of him and ask the psychiatrist if he should not send the boy to the reform school.

Then too, some social workers and even some psychiatrists feel that they are the special guardians of society and take it to heart when they fail to protect society from certain hostile, aggressive people. The psychiatric clinic has a function here in interpreting the broader issues at stake. Recently a conscientious social worker from a relief agency became very upset because the psychiatric clinic did not recommend commitment of a paranoid client of hers to the state hospital. Some years before this patient had killed two men ostensibly in self-defense and was acquitted both times. He sought the lime-light by suing people and parading his six children in rags while he made speeches against the community chest. Recently he had threatened the social worker if the agency did not give him more adequate relief. The agency was especially afraid of criticism for giving him special consideration. It was pointed out to the agency that no jury would commit this man as insane, and if it did, the hospitals in that state would not keep him partly because he had none of the more obvious symptoms of insanity and partly because of the hospitals' disgracefully overcrowded conditions. The question was raised as to why the social agency should shoulder the full responsibility of disposing of this man? Not only had the social agency given this man special consideration, but so had everybody who had come in contact with him. For years society took insults without complaining or doing anything about it. Legal authorities had handled him with "kid gloves." From early years onward society surely had its part to play in creating this special situation, and the taxpayer now has to deal with it as a "special situation."

The social worker gave this man's family adequate relief and his "nuisance value" dropped at once. He will continue to be a problem, however, from time to time all through his life. The community cannot wash its hands of him. Social workers can do no more than keep his "nuisance value" at a minimum, a service for which society should be very grateful. Such problems are not merely a matter for the social service and medical professions to correct. They involve the schools, the juvenile courts, law schools, departments of sociology and schools of religion. No one discipline has found the answer to human maladjustment or should hope to do so. Each should strive to recognize the contributions of the others and create the atmosphere and machinery for active coöperation.

Since close coöperation with these other disciplines is so important for a broader understanding of the ills of society, the psychiatric clinic should become a part of

every higher educational system. It should be community-supported and where possible academically protected and nurtured. In short, without losing sight of the main purpose for which it exists, namely, the refinement of therapeutic techniques, the psychiatric clinic should assume its share of responsibility in interpreting to the community the part the community itself is playing in the production of breakdowns, to the end that more adequate measures of prevention may come about.

FAMILY CARE, A COMMUNITY RESOURCE IN THE REHABILITATION OF MENTAL PATIENTS[1]

By HANS B. MOLHOLM, M.D., and WALTER E. BARTON, M.D.

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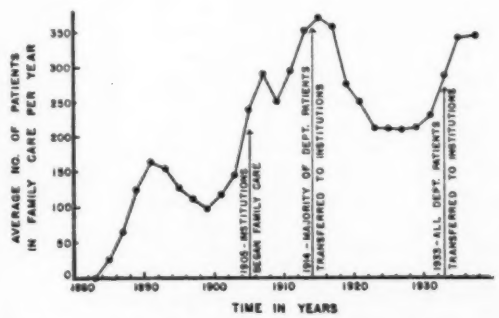
Family care is the practice of placing and supervising, in selected homes, mental patients who no longer require full hospital care. It is a valuable resource in treatment and rehabilitation which has never been fully utilized. Even in those states where it enjoys its widest popularity, namely, Massachusetts and New York, its use is limited to a few interested hospitals.

For centuries Belgium and Scotland have placed mental patients with private families in the community. Massachusetts pioneered



Graph 1.—Number of patients in family care from institutions and from the central department in Massachusetts.

in the practice of family care in the United States fifty-five years ago. In the twenty years from 1885 to 1905 all placements were made under the supervision of the Massachusetts State Board of Health, Lunacy and Charity. In 1905 the use of the family system was extended to the various institutions caring for the insane (see Graph 1). Mental hospitals, however, have not taken up the community placement of patients on any large scale. If family care reduces overcrowding, permits home care for chronic, undisturbed patients at lowered cost, or eliminates the need for expensive new buildings, promotes socialization and offers rehabilitation in a normal community setting, as has been variously claimed (1, 2, 3, 4, 5), why has it not been used more widely?

Since the Worcester State Hospital has for many years extensively practiced family care, this investigation was undertaken for the purpose of determining what actual advantages may be obtained through its use.

Method

The five-year period from 1934 to 1938 was selected because it was during this period that we began to use family care for convalescent patients in addition to the placement of quiet chronic ones (6, 7). More than a year has elapsed since the placement of the last patient. Thus a more reasonable evaluation of the present status of the patient is permitted.[2]

The case records of all patients placed for the first time in family care were analyzed and treated statistically. The social worker in charge of family care for many years made a subjective evaluation of the homes and of the interest of caretakers in patients for comparative purposes.

Criteria for Use of Family Care

It is the practice at the Worcester State Hospital to place in family care quiet patients who show no embarrassing oddities of behavior. Violent, destructive, aggressive and suicidal patients, and those with marked

[1] Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

[2] Some cases in the five-year sample were observed for six years and others only 15 months. The date of placement by year groups was compared with present status (April, 1940) to learn if the final outcome of placement was affected by the variable time interval. No real difference could be distinguished by the chi-square technique between the status on April 1, 1940, of living patients placed in family care in the year 1934 and 1938. Some of the 1934 placements had died as might be expected. Neither can year of placement be said to determine status in 1940 of the patients placed in the years from 1934 through 1938.

erotic tendencies are, of course, not placed. Nor do we send patients who are under medical treatment. Each individual is given the same careful consideration that one would employ if the patient were being sent out of the hospital on parole to his own home. Supervision is carried on by a social worker and a physician who visit at regular intervals.

Boarding out is an active service with about half of the patients having been in hospital residence less than a year prior to placement. Two hundred and nine women and ninety men were placed in family care for the first time during the period of our study.

Dementia præcox was by far the most frequent diagnosis in both sexes, about half the cases falling in this category. In women, manic-depressive psychosis and in men alcoholic mental disorders ranked next. Arteriosclerotic and senile disorders combined formed the third group in both men and women (Table I).

The age distributions are given in Table II. Thirteen patients were under 20 and two over 80 years of age. The average age for females was 46 years and for males 42.1 years. Sixty-nine men (76.6%) and 116 women (55.5%) of our group were single. Twelve males (13.3%) and 60 women (28.7%) were married. There were fewer married men than married women and more single males than females. The men in the group had been ill slightly more than a year and the women on an average of 2.4 years before hospitalization occurred. The average length of hospital stay before placement in family care was likewise higher in women than in men, 3.3 and 2.7 years, respectively.

TABLE I

NUMBER AND PER CENT OF PATIENTS OF EACH SEX PLACED IN FAMILY CARE ACCORDING TO DIAGNOSIS

Name	Female	Male	Total
Dementia præcox	99 (47.4%)	39 (43.3%)	138 (46.2%)
Manic depressive	23 (11.0%)	7 (7.8%)	30 (10.0%)
Psychosis with cerebral arteriosclerosis	11 (5.3%)	7 (7.8%)	18 (6.0%)
Senile psychosis	10 (4.8%)	1 (1.12%)	11 (3.7%)
Paranoid condition	16 (7.6%)	2 (2.2%)	18 (6.0%)
Psychoneurosis	11 (5.3%)	6 (6.6%)	17 (5.62%)
Mental deficiency	11 (5.3%)	5 (5.6%)	16 (5.4%)
Alcoholic psychosis	1 (0.52%)	13 (14.4%)	14 (4.7%)
Involutional melancholia	8 (3.8%)	1 (1.1%)	9 (3.0%)
Psychosis with organic disease	7 (3.3%)	3 (3.3%)	10 (3.3%)
Miscellaneous	12 (5.8%)	6 (6.6%)	18 (6.1%)
	209 (100%)	90 (100%)	299 (100%)

TABLE II

AGE AT TIME OF PLACEMENT

Sex	No.	20	20-29	30-39	40-49	50-59	60-69	70-79	80	Mean
Males	90	7	18	18	13	15	12	5	2	42.1
Females	206	*6	29	38	46	40	37	10	—	46.0
	*296	13	47	56	59	55	49	15	2	

* Three females not included on account of uncertainty about their age.

Family care is useful when the symptoms of mental illness have abated to the extent that the patient could be returned to the community if a suitable home were available. In other words, a suitable home is provided by family care for the patient who does not have one of his own.

Patients in family care fall into four groups according to the reasons for the placement: first, those whose families refused to take them; second, those with unsuitable home situations, largely because of family problems; third, those who had no place to go; and fourth, those either with special features in their illness which made it seem inadvisable to place them on visit

or where there were social situations which made family care advisable rather than abandon efforts to get the patient out of the hospital.

A few short illustrative cases may help to make these distinctions clear.

In the "family refused" group was a 42-year-old man suffering from general paresis, who for seven years before admission had been abusive to his wife. After four months of luetic therapy he was so much improved that the hospital recommended his release. The wife, however, refused to have anything further to do with him. As his guardian and in possession of a comfortable disability insurance policy she found life more enjoyable without him, especially since she had found someone else who interested her more than the patient. For three years she effectively blocked the hospital's attempts to release him. After placement in family care he was released, obtained a job of sorts and has been self-sustaining since.

A "family problem" is illustrated by 16-year-old J. U., diagnosed as suffering from psychosis with somatic disease, hypopituitary syndrome. His mother had transferred her hate of her unfaithful husband to the patient who strongly resembled the father. The boy had attempted suicide during a period of depression. It seemed inadvisable to return him to the mother, in view of her hostility. In family care he adjusted well, found work on a nearby farm and earned his release.

Some patients have "no other place to go," and for these family care often becomes a stepping-stone to freedom. Such was the case with M. B., a 53-year-old single woman diagnosed paranoid condition. Her face twisted with paralysis, she had lived a secluded life with her mother. After the mother's death she became quarrelsome and filled with ideas of religious persecution. After over five years of hospital residence, she found in family care the sympathy and understanding that led her to seek and find work as a housemaid. She is still a difficult person, but has supported herself for more than three years.

A case illustrative of the kind of cases falling in the "other reason" group was that of W. C., admitted to the hospital with general paresis at 47 years of age. He had accumulated a bit of money and had settled down during the depression to raising dogs. A guardian took over when the patient was brought to the hospital with expansive delusions and severe impairment of judgment. When he was improved and ready to leave, the guardian was fearful lest he return and embarrass her in the conduct of the business she had taken over. She used the weight of her influence to keep him in the hospital, but finally consented to his release to another town. He is still in family care adjusting well despite his fanciful notions about wealth and prospects for work.

The patients are distributed as follows in the classifications mentioned: 68 patients (23.4%) fell into the group of "family refused"; 136 (46.7%) were placed because of "family problems"; 59 (20.2%) had "no other place to go"; and 28 (9.9%) were placed in family care for "other reasons." It was not possible to classify eight additional cases.

The Selection of Homes

We have found suitable new homes usually through the acquaintances of caretakers who have patients. An unused room, or garden products for which there is no market, or the need for some one to help out with tasks, or a genuine desire to serve the unfortunates are the most frequent motives that seem to lead a family to seek family care boarders.

It is not our intention to go into detailed discussion of the criteria for the selection of homes. Miss Helen Crockett(6) has already discussed these, emphasizing the importance of the personality of the caretaker and of the interest that each member of the foster family shows in the patient's problem.

We are certain that patients do best in the homes of satisfied people. There is a feeling of unity and interest that can be sensed in good homes that is much more important than physical comforts. Each patient must have a separate bed; no more than three patients sleeping in a room. It is preferable that not more than four patients be placed in a single home, although there are a few exceptions to this rule. One naturally avoids placing a patient in a home above the social standard to which he is accustomed. It is usually easier to adjust to simpler standards. People of similar tastes are, whenever possible, placed together. It is necessary to give the caretaker an understanding of the patient's problems so that she may give more skillful assistance. Frequent visits are made by the social worker immediately after placement, in order that minor points of friction may be cleared up at the outset.

Of the 63 homes used in this study, 27 (42.8%) were in rural districts, at least two miles from the nearest town. Seventeen (27%) homes were in towns of 5000 or less, and 19 (30.2%) were in cities of over 5000 population. Forty of our patients were

placed in rural districts, 30% in towns and 30% in cities.

In rating the homes, the social worker made three categories: "good," if surroundings were comfortable, with well-ventilated sleeping quarters, adequate furniture and adequate food, and if the caretaker was understanding; "fair," if only moderately fit in these requirements; and "poor," if unfit in several items. In one group 187 (63.6%) were placed in what were believed to be "good" homes, 68 (23.1%) in "fair" homes and 39 (13.9%) in "poor" homes.

We found that the patient's ability to stay in a family care home did not indicate that the home was "good" with respect to any of the characteristics we studied. Not only were more patients returned to the hospital from "poor" homes, but more remained in "poor" homes than in "good" homes. On the other hand, more patients were discharged or released from "good" homes than from "poor" homes.

Results of Placement

The results of a patient's placement in family care can be evaluated either in terms of the immediate outcome of his original placement or in terms of his present status as of a particular date. We chose April 1, 1940, fifteen months after the last initial placement had been made, as allowing sufficient lapse of time in the majority of instances to determine the result of placement.

The immediate outcome of placement of the 299 cases of family care is shown in Table III. It was necessary to return to the hospital 148 (49.5%) patients from their first placement. Ninety-two of these were returned by reason of the recurrence or aggravation of mental symptoms; 30 because of physical disorders; and 25 for other reasons, such as the caretaker giving up her home. Of the 148 who returned to the hospital, 60 (40.5%) were subsequently replaced in family care, 22 persons (14.9%) were later discharged directly from the hospital, and 3 more (2%) are on indefinite visit; 14 patients (9.5%) died. One-third (49) of those returned to the hospital continued in residence. While nearly half of the patients were returned from their first placement, only a third of these had to remain in the hospital. The figure for returns seems high, but it includes physical illness and many patients who were placed early in their convalescence.

Of the 75 cases who were released on visit, 21 (28%) subsequently were returned to the hospital for mental reasons. Fifty-four patients (72%) were ultimately discharged, and of these about half were released into the care of their own families and the others were released into their own care if they found work. Two patients were placed on public relief. Of the 18 patients in the group who were discharged directly, only one has been returned. Six were released to public relief agencies, 2 to the institutions, 5 to the families, and 4 into their own care.

TABLE III

The Immediate Outcome of First Placement in Family Care of 299 Patients

	No.	%
Returned to hospital	148	(49.5%)
Released on visit	75	(25.1%)
Discharged	18	(6.0%)
Escaped	16	(5.4%)*
Stayed in family care	41	(13.7%)
Died in family care	1	(0.3%)
	299	(100%)

* All but one of the escaped patients were promptly returned.

Sixteen patients left their family care homes without permission, but only one remained out more than a short time. This individual was afterwards discharged, still on "escape" status.

The number of different placements is illustrated by the following: Two hundred and eight (69.9%) of the total group were placed in a single boarding home; 68 (22.7%) were placed twice; 18 (6%) were placed three times; 3 (1%) were placed four times; 2 (.7%) were placed five times. There was no significant difference between the sexes as to outcome insofar as the number of placements is concerned. Ninety-four patients (79%) were discharged after placement in one home and only 25 patients (21%) were discharged after placement in more than one home. The mean length of time in the first family care placement was

11.1 months for males and 14.4 months for females.

Two factors seemed to influence the immediate outcome of the initial placement. The first is the amount of interest shown in the patient by the caretaker and the second is the opportunity for work and recreation at the home. Some caretakers showed great interest, were extremely helpful in solving patient's problems and spent much extra time with the group. Caretakers were considered to be "sympathetic" when less active in helping the patient and "indifferent" when almost no activity was shown toward patient problems. "Mercenary" caretakers took patients chiefly for board paid. Only 277 patients were classified as to interest of caretaker. The number in each class being: "great interest" 75, "sympathetic" 164, "indifferent" 33, "mercenary" 35.

There was no significant difference in the discharge and parole rates from boarding homes where caretakers were classified as sympathetic as contrasted with those believed indifferent. However, where great interest was shown in the patient it appeared to affect the outcome, judged by the fact that more patients were discharged.

About 57% of the patients were discharged or on visit from the "great interest" group and only 24% from the "sympathetic and indifferent" groups. This difference is significant with the probability less than .01 when tested by the chi-square method. It can be seen that more patients remain in family care or return to the hospital when the caretaker is not so active in her interest.

Homes were classified as "good," "fair" and "poor" with respect to the opportunity they provided for work and recreation. Comparisons were made only between "good" and "fair" homes because only 3 were considered "poor." The relationship found between the immediate outcome and the opportunity for work and recreation was practically the same as that for the amount of interest of the caretaker. More patients go on visit or are discharged, and fewer return to the hospital, from homes that provide these advantages than from homes rated as fair in opportunity for work and recreation.

In our classification of homes as to city, town and country, in relationship to the immediate outcome of placement, we found a tendency for more patients to be discharged from the city with fewer returns to the hospital than occurred in both town and country homes. It is quite probable that the type of patient selected for city residence as well as the increased opportunity for work, were factors operating to produce this result.

We have had only two instances of objection on the part of people in the community to mental patients being placed in their midst. In one, an effort was made to evoke the zoning ordinance. In another instance neighbors were frankly fearful and openly hostile to attempts to place patients in their community. In the great majority of cases, the community was either helpful or unconcerned by mental patients in their midst.

Table IV reveals the outcome of placement in family care as of April 1, 1940, regardless of all that has happened since the first placement. It will be seen that 68 patients (22.7%) still remain in family care; 105 patients (35.1%) have been returned to the hospital (of these, 18 subsequently died); 126 patients (42.4%) were either released on visit or discharged.

Table V shows that 101 (48.4%) women were in the hospital less than one year before placement; 33 from one to two years (15.8%) and 75 (35.9%) two years or more. Of the 90 men placed in family care, 44 (48.8%) had been in residence at the hospital less than one year prior to placement, 16 (17.8%) from one to two years, and 30 (33.4%) two years or more. This illustrates very plainly the shift in the number of patients placed in family care during their convalescence. Copp(4) in his study of 20 year use of family care during its early stages, found that 65% of his cases had been in residence for two years or more in the hospital prior to placement in family care. Only 35% of his cases as contrasted with 65% of ours had been in residence in the hospital less than two years.

We found that the length of residence exerted, as one would expect, an effect upon the final status of patients. More patients were discharged and fewer returned to the hospital when their placement was made during the first year of hospital residence

TABLE IV

PRESENT STATUS (APRIL 1, 1940) OF PATIENTS PLACED IN FAMILY CARE (299 PATIENTS)

	Female	Male	Total
Still in family care	50 (23.9%)	18 (20.0%)	68 (22.7%)
In hospital			
Returned for mental reasons	50	19	69
Returned for physical reasons	7	5	12
Returned for other reasons	2	4	6
	59 (28.2%)	28 (31.1%)	87 (29.1%)
Discharged			
To family (guardian)	37	14	51
To self, with work	19	15	34
To self, no work	7	4	11
To public relief	7	5	12
To mental institutions	2	—	2
To other institutions	2	2	4
Unstated	4	1	5
	78 (37.3%)	41 (45.6%)	119 (39.8%)
Dead			
While in family care	1	—	1
After return to hospital	16	1	17
	17 (8.2%)	1 (1.1%)	18 (6%)*
On visit			
To family	4	—	4
To self, with work	1	1	2
To self, with no work	—	1	1
	5 (2.4%)	2 (2.2%)	7 (2.4%)
Total	209 (100%)	90 (100%)	299 (100%)

* One male was discharged to self but committed suicide 18 months later, making the total dead 19.

TABLE V

RELATION BETWEEN LENGTH OF HOSPITAL RESIDENCE BEFORE PLACEMENT AND PRESENT STATUS OF 299 PATIENTS PLACED IN FAMILY CARE

		Returned to hospital *	Visit or discharge	Still in family care
Less than one year				
Male	44	33 (14.4%)	27 (30.0%)	4 (4.5%)
Female	101	33 (16.0%)	31 (24.0%)	17 (8.2%)
Both	48.5%	46 (30.4%)	58 (54.0%)	21 (12.7%)
One to two years				
Male	17	8 (8.9%)	6 (6.7%)	3 (3.33%)
Female	33	13 (6.2%)	17 (8.2%)	3 (1.4%)
Both	16.7%	21 (14.11%)	23 (14.9%)	6 (4.37%)
Two years or more				
Male	29	8 (8.9%)	10 (11.1%)	11 (12.2%)
Female	75	30 (14.3%)	15 (7.1%)	30 (14.3%)
Both	34.4%	38 (22.12%)	25 (18.2%)	41 (26.5%)
Total				
Male	90	29 (32.2%)	43 (47.7%)	18 (20.0%)
Female	209	76 (36.3%)	83 (39.7%)	50 (23.4%)
	299	105	126	68

* Includes those who returned to hospital following escape and those who died upon return.

than occurred after two years of hospitalization (Table V). When more than two years of hospital residence elapses before boarding out, fewer discharges result and many more remain in family care. The transition group of from one to two years of hospital residence before placement, shows sex difference in that the discharge rate after the first year in men does not decline as rapidly as with women.

The relationships between present status and the three principal reasons for placement in family care are shown in Table VI, which includes data on 263 of the 299 patients. Of the 36 patients not included 28 fell into the "other reasons" group and the remaining eight patients were not classified as to the reason for their placement in family care. No significant sex differences were found in three principal reasons for placement, but significant differences were found between civil condition and reason for placement. In the "family problem" group there were more married and fewer single females and more single and fewer married males. This difference has a probability of less than .01. In the "family refused" group there were more single males than single females. This difference has a probability of less than .01. In the "family refused" group more males than females were discharged. This difference has a probability of .05.

With respect to present status, significant differences were found in each of the three possible combinations of the three principal reasons for placement. More patients had been discharged and fewer had returned to the hospital from the "family refused" group than from the "no other place to go" group. ($.02<P<.057$.) More patients had been discharged, fewer were in family care and some fewer had returned to the hospital from the "family problem" group than from the "no other place to go" group. ($P<.01$.) More patients were discharged, some fewer were in family care and more had returned to the hospital from the "family problem" group than from the "family refused" group. ($.01<P<.02$.)

The relationships described in the last paragraph undoubtedly depend in part on differences in the patients, just as does the relationship between present status and the length of hospital residence before placement. Furthermore the relationships between the interest of the caretaker, or the opportunity for work and recreation, and the immediate outcome of the original placement

TABLE VI

RELATIONSHIPS BETWEEN PRESENT STATUS AND REASONS FOR PLACEMENT

	Reasons for placement								
	No other place to go			Family refused			Family problem		
Present status	Males	Females	Total	Males	Females	Total	Males	Females	Total
In hospital:									
Number	9	12	21	5	11	16	10	32	42
Per cent	50.0	28.6	35.6	22.7	23.9	23.5	27.8	32.0	30.9
In family care:									
Number	3	14	17	5	16	21	5	12	17
Per cent	16.7	34.1	28.8	22.7	34.8	30.9	13.9	12.0	12.5
On visit:									
Number	1	0	1	0	1	1	0	3	3
Per cent	5.6	0.0	1.7	0.0	2.2	1.5	0.0	3.0	2.2
Discharged:									
Number	4	8	12	12	14	26	20	46	66
Per cent	22.2	19.5	20.3	54.5	30.4	38.2	55.6	46.0	48.5
Died:									
Number	0	7	7	0	4	4	1	6	7
Per cent	0.0	17.1	11.9	0.0	8.7	5.9	2.8	6.0	5.2
Escape—discharged:									
Number	1	0	1	0	0	0	0	1	1
Per cent	5.6	0.0	1.7	0.0	0.0	0.0	0.0	1.0	0.7
Totals	18	41	59	22	46	68	36	100	136

undoubtedly depend in part on differences in the patients, since those with the best prognosis are placed in the best homes if there are no contraindications to such placements. Consequently most of the significant relationships described in this paper were expected on account of the high degree of selection, both of patients and of homes, that characterizes family care as practiced by the Worcester State Hospital. The finding of these expected relationships demonstrates the desirability of providing for patients, no longer requiring full hospital care, suitable homes in the community when they do not have such homes of their own.

Special Consideration

A question that naturally arises is the comparative cost between the hospital care and that of boarding patients out in private homes. All are agreed that the cost of medical and social service to patients outside of the hospital in boarding homes is less than that of the customary mental hospital care. Hamilton(8) says "The average per week for each patient in family care amounts to approximately $7. This includes board and room at $4.50 per week plus $2.50 clothing and medical supervision. In the hospital the same care would cost $8.25." Thompson(9) found salary and maintenance expense of supervisors and transportation with clothing and board to patients to cost $4.94 a week for each patient in family care when he had 119 patients out as compared to a $7.55 weekly per capita cost for patients in the hospital. Copp(5) and Harrington (10) have also found family care to be a distinct saving. Probably all cost estimates so far available do not adequately cover general administrative expense.

In Conclusion

We believe that within the community there is a valuable resource for the treatment and rehabilitation of mental patients. The slowly improving case with mild symptoms or the quiet chronic patient, and especially the early case of mental disorder with a poor or inadequate home situation, gains most from the placement in a private family in the community. There is a great need for extension of the use of this resource. Even in Massachusetts and in New York where the practice is most in favor, only a few institutions practice family care on a large scale. The construction of costly new buildings can be avoided by placement of some patients outside the hospital. The placement is made to the distinct advantage of the tax payer as it appears to cost less to care for a patient in a boarding home than within the hospital walls. An added advantage is the return of the money to pay for care to the community resident.

Summary

A study is reported of 299 cases placed in family care by the Worcester State Hospital during the 5-year period from 1934 to 1938. This period was selected as it represented the time during which special emphasis was being placed on the use of family care for convalescent cases. Of these cases 23.4% were placed in family care because their family refused to accept them at home; 46.7% had family problems that made it seem advisable to introduce family care as an intermediate step before considering their return to their own homes; 24.2% had no other place to go; and 9.9% were placed in family care for other reasons. The study indicates that:

1. The majority of patients sent into family care (65%) had been hospitalized less than two years prior to placement as contrasted with Copp's group in which 65% had been hospitalized more than two years (5). Convalescent rather than chronic cases are boarded out by us.

2. Forty-two per cent of the patients placed were discharged or paroled and an additional 22% remained in the community in family care.

3. Discharge and visit rates were higher and fewer patients returned to the hospital or remained in family care when patients were placed before the end of the first year of hospital residence.

4. The factors outside the patient which seem to be important in effecting a favorable result in addition to the minimum standards of a comfortable boarding home are: (a) the interest of the caretaker in patient's

problems, (b) the opportunity for work and recreation.

5. Family care appears to be a valuable community resource for the rehabilitation of mental patients who do not have a suitable home of their own. This practice deserves more widespread use.

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COMMUNITY CARE OF THE MENTALLY DEFECTIVE[1]

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The problem of mental deficiency is not peculiar to any one mountain-fast or slum district, but unfortunately, extends as a social taint throughout all national groups. Two major aspects of this problem exist, namely—the responsibilities of the state institutions toward the mentally defective, and the rôle of the community in the social and economic integration of the subnormal. Because the problem of mental deficiency in this country has been handled largely through publicly supported organizations, such as state departments of mental hygiene or their equivalents, or boards of education, many citizens have gained the impression that the state is primarily responsible for the care of mental defectives. It is true that the state does assume a large responsibility in the care of defectives, but the making of state institutions into dumping grounds for all community misfits of below average intelligence is obviously a socially impractical plan. It is time for the community, therefore, to reconsider the whole problem of mental deficiency—to ask who and how many are mentally defective, how may they be appropriately handled, and what of the oncoming generations of defective stock?

One naturally first turns to the question—who and how many are mentally defective but quickly discovers that there is much confusion in the answers to this question. It would require more than a volume to discuss this matter theoretically and clinically. The writer will make, therefore, only brief answer to this question and will consider in practical terms, social groupings of defectives in the community, their immediate needs, and the problem of further social planning.

A. Who and How Many Are Mentally Defective?

In a personal communication, Dr. Horatio M. Pollock, Director of the Division of Statistics, Department of Mental Hygiene in New York State, has pointed out that "the question of the prevalence of mental deficiency in the population is one that cannot be answered from any data now available. The estimates made by the writers of the reports submitted to the White House Conference(1) are guesses from unstandardized data. The different writers of the White House Conference Reports were not in agreement as to the proportion of mental defectives in the population." Dr. Pollock continues by stating that "in the War Department volume entitled 'Defectives Found in Drafted Men' the ratio of mental deficiency per 1000 men was found to vary from 2.32 in Arizona to 30.90 in Vermont. In New York State the ratio was 9.24. For the whole United States it was 12.06. This last ratio was 1.2 per cent of the enlisted men examined."

Some of the more careful and extensive current studies have placed the number of mental defectives at from .8 per cent to over 5 per cent of the total population. The bases for these estimates uniformly include all of the lower grade groups—idiots and imbeciles—and a varying number of those who by psychological classification may be considered of moron or borderline intelligence, but who are more or less socially incompetent, *i.e.*, "incapable of managing themselves and their affairs with ordinary prudence." This grouping does not in any way take account of the large group, variously estimated at from 11 per cent to 15 per cent of the population, whose intellectual

[1] Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

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capacities are definitely below average, and who are classified on the basis of psychological ratings as dull normal, borderline normal and high grade defectives. The White House Conference Report(2) includes this group with the low grade groups under the general covering term "mentally defective." Other authors prefer the covering term "intellectually subnormal."

A helpful contribution to the attempt to classify these groups has been found by the writer in the manuscript of a book on "The Subnormal Adolescent Girl" which is being prepared by Dr. Theodora M. Abel and Dr. Elaine F. Kinder. These authors have kindly permitted the writer to include their classification which is based upon the social needs and requirements of the various groups. This classification may be outlined as follows:

(a) *Custodial Care Group.*—This group which includes less than 1 per cent of the total population contains all idiots and imbeciles, as well as those of the lower-grade moron group, who require constant custodial care.

(b) *Supervisory Care Group.*—This group, representing approximately 1 per cent of the total population, also termed by these authors "intermediate subnormals," includes many morons, especially of the lower grades, as well as a number of borderline and dull normal individuals with serious adjustment difficulties. These latter may or may not be generally considered mentally defective, depending upon the definition of defect. There is little disagreement, however, on the question of care, for this group requires extensive supervision, either through permanent residence within an institution, or through adequate supervision within the community. Environment plays a determining rôle in the evaluation of their subnormality.

(c) *Guidance Group.*—This group constitutes the bulk of the subnormal population, and comprises those who are not generally considered mentally defective, even though the group includes many who on a psychological basis, may be considered morons. The number of individuals from this group who need guidance, and even periods of supervision, increases in times of stress. Even in the best of times their lives are largely determined by the more intelligent of their associates, whether these be their more competent relatives, their more dominant neighbors or friends, or the ulteriorly minded visitors of a ward political machine.

It will be seen that the foregoing classification takes into account, not only test results, but also social criteria of defectiveness and the part which the community plays in some more or less clearly recognized fashion. The writer would like to emphasize that the problem of these subnormals, many of whom should not be considered strictly as "mentally defective" and who have been included by Lewis(5) under the term "subcultural," are largely adjustment problems which fall clearly within the interests of organizations such as the American Association on Mental Deficiency, The American Psychiatric Association, the clinical section of the American Association for Applied Psychology and other national groups concerned with the welfare of those individuals whose mental integration is somewhat below the average.

If we review past attitudes toward mental deficiency, too often there appears a tendency to consider the mentally defective primarily in terms of "low-gradedness" with emphasis upon "custodianship." The lower-grade defectives certainly represent the more spectacular parts of the field and constitute an important problem to both community and the institution, but it is the high grade, borderline and dull normal groups who are of far greater numerical, social and economic importance to the nation.

One of the difficulties in defining the groups that are respectively the responsibilities of state or community organizations is the lack of clear understanding of the clinical material and its proper disposition and treatment. For example, it is not necessary to care for all of the low and middle grade subnormals in institutions as many may be kept within the community; State responsibility for the care of mental defectives need not end with institutional care but should be extended into coordination with community service. Most defectives are in the community and it is in the community that a far-reaching program is needed. The possibilities of state and com-

munity coordination have hardly been explored.

To illustrate the need for clearer understanding of the nature of mentally defective clinical material in the community, reference may be made to recent work on this problem.

B. Classification of Mental Defectives in the Community According to the Need for Treatment

General medical and pathological analyses of mental defectives do not properly fall within the range of our topic but classifications involving sociological and psychopathological factors obviously do. Yet, it will be impossible here to present other than brief suggestions of the latter factors of classification.

The Committee on the Needs of Mental Defectives in New York City made a report (3, 4) in 1939 in which an analysis was made of 436 cases on the Department of Hospitals' waiting list for admission to state schools. The following classification groupings based upon the need for treatment were outlined:

A. State School for Mental Defectives

Children recommended for this type of care include:

I. Simple care—children whose needs are best met by routine hospital or dormitory care within the institution.

II. Close group supervision—children whose behavior is sufficiently disturbing to require as a group the care, supervision and training that the institution alone can afford through its cottage life, school and work programs.

III. Special individual supervision—children whose behavior is disturbing to such a degree that it is necessary to devise programs of care and treatment to meet the particular needs of the specific individual.

B. Special Institutional Care

This group includes:

I. Defective delinquents—individuals who have exhibited anti-social behavior to such a degree that disciplinary supervision within an institution is required.

II. Specific psychopathies—individuals suffering from disorders of personality and behavior which should receive special psychiatric institutional care.

III. Convulsive disorders—individuals whose behavior is more or less typical of the epileptic personality or is affected by seizures which interfere with the establishment of average relationships in the schools or community.

C. Community Care

On the basis of the case record, it was thought that were additional facilities, both in personnel and community resources, made available to the Department of Hospitals, a group of cases might be given another opportunity to adjust within the community. For these cases the following types of community supervision are recommended:

I. Simple community care—children whose behavior is generally satisfactory and whose needs could be fulfilled by psychiatric or case work service to the family as a whole or by placement in either a foster home or child caring institution.

II. Individual case work—children who personally require special case work services whether in true or foster homes.

III. Psychiatric case work—children who, in true or foster homes, require special study and treatment of a mental hygiene clinic in addition to social case work services.

D. Miscellaneous Unclassified

This group includes cases on which the data were insufficient for classification.

The statistics showed that approximately 66 per cent of the cases on the waiting list would most likely be suitable for state school assistance; approximately 12 per cent needed special institutional care; and that nearly 19 per cent very likely could be kept within the community were more adequate mental hygiene and social service facilities available. It may be noted under the Community Care classification, 51 per cent of the 84 patients were placed in the group needing only simple community care, 45 per cent were thought to need individual case work services, and 3 per cent needed psychiatric case work services. When viewed from other angles, psychiatric case work services could render much more extensive and invaluable aid to mental hygiene work with defectives and their families in the community-at-large. It is seen that section C—community care—represents in general, those defective individuals who might profit by community psychiatry but whom community psychiatry has largely not called its own.

The following clinical material from Letchworth Village may serve to emphasize the need for community psychiatry in the field of human subnormality:

I. *Simple community care:*

Case 1.—J. B.—C. A. 5 y., 4 m.; M. A. 4 y., 4 m. Signs of rickets of skull and chest were only evidence of physical abnormality. The psychologist

reported that although his speech is unclear, the present test ratings indicated that he is of dull normal intelligence. The father is dead and the mother gave the impression of being of borderline intelligence. She had a psychotic episode characterized by depression and suicidal attempts ten years ago. The patient has been threatened by the mother. This child simply needed another home in the community and because the community had failed to supply this opportunity, the child was finally admitted to a state institution.

CASE 2.—I. C.—C. A. 13 y., 3 m.; M. A. 9 y. No gross pathological signs were noted physically. Psychologically, he showed excellent effort on all tests and did not give the impression of being mentally defective—rather of borderline intelligence. The father is hospitalized for tuberculosis; the mother appeared to be dull and could not speak or understand English. A half-brother is in a state institution for defective delinquents. The patient has given no particular trouble and he was institutionalized for lack of proper supervision which the community could have afforded him through a foster home.

II. *Individual case work:*

CASE 3.—R. C.—C. A. 9 y., 2 m.; M. A. 6 y., 2 m. Physically the patient is very much undersized for his age. His rating on the Stanford-Binet placed him in the moron group but his performance on non-verbal tests is at the borderline or dull-normal level. The child is illegitimate; a maternal aunt is said to be defective. The mother openly rejects the child and states: "My husband is showing resentment towards him which causes many arguments." A review of the family situation indicates that individual case work would very likely have made it possible for the child to remain at home.

CASE 4.—S. S.—C. A. 9 y., 10 m.; M. A. 7 y. Physical signs suggested congenital syphilis, although Wassermann was negative. Psychologically the general impression from test results was that she was not defective. The father was abusive, intemperate (for which he was jailed twice) and practiced sexual irregularities with his daughters. He had no steady work. The mother, who was subject to vicious assault by the husband, was committed to a state hospital with diagnosis of dementia præcox, paranoid type. The patient was committed because of masturbation and alleged sex experiences with her brother and a colored boy. In a boarding home she needed constant watching when in the company of other children. While this case represents a borderline condition which might warrant more intensive treatment, it was thought that further boarding home care with active individual case work might have been adequate to meet her needs.

III. *Psychiatric case work:*

CASE 5.—A. M.—C. A. 12 y., 2 m.; M. A. 9 y., 10 m. Physically is undersized for age. Psychologically the patient is of dull normal intelligence. The father is uneducated, illiterate, resents any interference in his management of family life but has good habits and is interested in family. The mother was cooperative and interested in family. However, the patient at home was disobedient and beyond control of his mother. He was overactive, impudent and saucy. He has deserted his home, has indulged in petty thieving, kept late hours and was untruthful. A tactful approach to both the home and the boy through psychiatric case work very likely would have prevented the child from being committed to a state school for defectives.

CASE 6.—G. Y.—C. A. 13 y.; M. A. 10 y., 3 m. Physically the girl appeared healthy. Psychologically she gave the impression of being unstable and very unsure of herself. The indication seemed to be that her Terman test rating would have been well above the defective group if she had been more cooperative. The impression is that she is a dull, but not defective child. The father, who was a musician, is dead. The mother is apparently not of average intelligence. One brother is serving a term in a reformatory for theft; another brother is in an institution for defective delinquents. The patient has never had proper home training. She is still enuretic, bites her nails, is very untidy, defiant, impertinent and disobedient. A review of the case indicates that active psychiatric case work might have enabled the child to remain in the community.

These borderline and dull normal cases have been selected from a state institution population because they indicate that large state institutions may be called upon to do work which the community should properly perform. Certain children falling intellectually more definitely within the defective ranges, might also be cited as proper responsibilities of the community. The aid of the state school should be enlisted as one of the resources whenever the interests of the child's development are best served thereby, but the state school should not be considered as a dumping ground which will enable the community to evade its responsibilities.

C. Community Psychiatry in Relation to the Field of Education and Economics

The development of our topic has included questions of who and how many are defective, various groupings of defectives and their needs, and now requires consideration of the field of mental deficiency in terms of better social planning.

The community's job is largely with the social-minded and adaptable high grade defective and the so-called intellectually sub-

normal except where social conditions call definitely for institutional care and training. Institutionalization is especially desirable for certain maladjusted high grade subnormals and the "intermediate defective delinquents." It may be pointed out that much work must be done for the so-called "intermediate defective delinquents" through the establishment of organizations to serve as custodial and training centers for individuals not suitable for treatment by state schools, state training schools for juvenile defective delinquents, state institutions for defective delinquents and special community homes as all of these institutions are now organized. In other words, the intermediate defective delinquent is too dull for training schools for juvenile delinquents, too bright and too delinquent for state schools, and too young and not sufficiently delinquent for state institutions for defective delinquents.

Increased interest must be aroused in the problems of interinstitutional and institutional-community relationships. It is clear that although the state institution must play a varied rôle in the care of mental defectives, the community must play a still greater one which it is now largely neglecting.

One of our real problems is the education of professional and lay groups of the community in reference to the wide variation in defectives and subnormals, and the widely differing care, treatment and supervision required.

Community psychiatry in relation to the field of the subnormal should include not only psychiatric and social work, but also, coordinated planning with the community, schools and labor organizations. This planning will require extensive exploration into the social and economic resources of community organization. Many answers to the question of the social absorption of the subnormal are still to be found. However, community psychiatry in its work with the personality of the patient and the organization of his home and neighborhood life should call into play the growing forces of social construction as found in the ungraded classes, the vocational schools, the clinics and classrooms of educational psychologists, and auxiliary labor organizations. Educational resources can supply in increasing measure: opportunities for the development of the learning potentialities of defectives; special education in overcoming specific disabilities; and vocational training which will definitely equip the subcultural worker with skills which he might apply in practical fashion were the industrial organizations of the community ready to absorb him.

Training programs for adults should focus attention upon problems of industrial adjustment and absorption. In the interests of economy alone, industrial resources of the community should be mobilized to aid the subnormal worker through auxiliary labor organizations. While it is true that many highly intelligent and skilled workers are now out of employment, and that employers naturally prefer these workers to the less skilled, labor organizations should carefully consider the great economic losses entailed in neglecting many reliable hewers-of-wood and drawers-of-water among those of the subcultural groups. A self-supporting or partially self-supporting subnormal person is of much less expense to the taxpayer than one dependent upon state or community funds for support. In 1939 approximately one fourth of the total New York State budget of over $371,000,000 went to the support of the mentally incompetent, the mentally ill, defectives, delinquents, criminals and others variously dependent. Considering these individuals in terms of physical, intellectual, emotional or social liabilities, we are paying dearly for our incompetencies.

Although research has not yet made it possible to determine what technically constitutes "social deficiency," assistance in this problem may be afforded through attention to the basic psychobiological terms of developmental arrests in the physical, intellectual, emotional and social integrations of man. In face of the annual increases in our budget, it is imperative that we utilize every opportunity that we can to make each employable citizen self-supporting. In the field of the mentally defective, the subnormal and the subcultural, the psychiatrist has a unique opportunity to relate his professional activities to practical problems of education, industry and economics in general. Only through the closest cooperation with those active in the field of the subnormal and with

those in general education and industry can solutions be found for many of the pressing social-economic problems before us.

It is a serious mistake to consider the problem of the defective without taking into account the possibility of a program of broad social planning. Defectives affect the total social structure, and the social structure faces the task of absorbing present defectives and of seeking to reduce the number for the future. Utopia in social relationships will not be ushered in by the next presidential election but much for the future must be accomplished by our setting into motion social mechanisms for the actual control of mental deficiency several generations hence. Many states are experimenting with the problem of the care and control of mental defectives. As an example, a résumé of the assets and liabilities of the present program for the care of mental defectives in New York State may be found in the 1939 Proceedings of the American Association on Mental Deficiency(4). Conspicuous among the liabilities is the lack of adequate community service. The report of the New York City Committee on the Needs of Mental Defectives(2, 3) emphasizes in its recommendations, extensive increases in mental hygiene, social service, educational, industrial resources to the community. The need for closer state interdepartmental and community coordination of clinical, legal, training and social planning resources is stressed in the report.

New York State, as all states, is in need of awakening its citizens to a higher consciousness of civic life and civic responsibility. It can do this only through research, education and more adequate social planning in the field of the subcultural, which can mean something more than increased efficiency in the big business of skyscrapers. Through the better understanding of the mentally defective, the subnormal and the subcultural, they become more significant as caricatures of our weaker selves and of the arrests in development of our world society of today.

Summary

This paper presents the thesis that the subnormal should receive much more adequate community care and suggests certain possibilities for increasing the effectiveness of the treatment of this group. This thesis is developed by:

(a) A general review of the estimated numerical extent of the subnormal in the total population with stress laid upon the degree to which the community is involved in the problem of the subnormal.

(b) A suggested classification of the subnormal in the community on the basis of need for care and treatment according to which defectives would be assigned for (1) state school for mental defectives, (2) special institutional care, (3) community care.

It is suggested that improved treatment will result from:

(a) An enlargement of the concept of psychiatric work which will deal with the problems of the subnormal in more inclusive aspects, particularly as they are related to education and to economic adjustment.

(b) A comprehensive state and community program of research, mental hygiene, education and social planning for the subnormal.

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THE PRIVATE PRACTICE OF GENERAL PSYCHIATRY[1]

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If you will permit me, I shall take the liberty of speaking to you personally and freely concerning the private practice of general psychiatry, as a miller might tell about milling or a chauffeur about driving a car. One can only voice a personal utterance on this subject, so you may be sure that my own view suffers from the special bias and limitations that might belong to any individual occupied in a special field of medicine.

To begin with, the private practice of psychiatry is paradoxical. In some aspects it is the most satisfactory of pursuits, while at the same time in other ways, it is very unsatisfactory. I shall try to describe the satisfactory and the unsatisfactory features of this work, the advantages as well as the disadvantages, from the point of view of the physician, and the patient. Let us begin with the physician.

Only a person of a very special sort "goes in for" psychiatry. It is probably not the "average" college graduate who enters medical school. Certain other features distinguish that small but growing fraction of medical school graduates who enter the specialty of treating nervous and mental diseases. Some of these features are:

1. Special experiences of emotional conditioning in youth.

2. Definite personality or adjustment problems in the individual himself.

3. The development of a special point of view described as "being psychologically minded" or "seeing individuals as human beings" or "seeing things as a whole."

4. A tendency towards meliorism which can be more simply expressed as "a desire to help people"—and to be helped.

But these elements alone do not complete the synthesis that the individual must undergo while developing from adolescence through the long period of training into a psychiatrist. He is qualified further by that modicum of intellect with which he may be endowed and by the way he may have developed it in attempting to grasp and retain the knowledge to which he may have been exposed in the process of his so-called education, and in the maturation of his own character and personality. There, of course, is the rub. Some men are born wise, some achieve wisdom and some have it thrust upon them. This statement is doubly significant when applied to the psychiatrist who is fortunate if he can choose a background of adequate cultural richness, and if his experience leads him to complement this with contrasting views.

Ideally one might wish (if one were compounding a psychiatrist by alchemy) to add these ingredients too: (1) A healthy amount of vigor. (2) Knowledge of fields of thought other than his own. (3) A reasonable acquaintance with nature, science and logic. (4) A sense of wonder and a desire for further knowledge. (5) Respect for the feelings and the spirit of others.

Though this may sound like a recipe for a superman, not only is the doctor favored who can acquire some of these, but the patient may also benefit from the way these attributes reflect on the therapy as well.

The psychiatrist should have other interests, a balanced mental diet, lest he suffer that particular prison psychosis that comes from being too long immured in his ivory tower, or from having played too long the rôle of God in the lives of his patients to the further amazement of his own astonished heart, and he should retain some humility, but not too much humility.

Now as to training for private practice, that depends upon the psychiatrist's aim. At the present time the best is probably the longest, but that may not always be the case. Means of determining aptitude and shortened methods of training and techniques for therapy may be discovered, or at least we can search for them, and as we search we may continue to ask these questions:—Can it be that therapeutic zeal (and wisdom if such exists) is innate? What extrinsic fac-

[1] Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

tors condition it? If a man has therapeutic aptitude does the mechanical part of medical education increase or decrease it? And what are the most effective avenues of therapy?

In so brief a presentation as this, one can only suggest or touch lightly on these points but they, and many others like them, are matters of great concern to the psychiatrist and to those who are responsible for his education.

Let us now consider the patient. Conditions today that affect him are changing so rapidly that one must be a cover-to-cover reader of *Time,* in order to keep abreast of *what* is temporarily happening *where,* and unless one reads several good newspapers, listens to selected radio programs and follows the discussion of current events with well-informed and intelligent authorities, one is apt to be antiquated in one's views of the modern world, and in some ways this gives a mild advantage in that it permits the maintenance of certain uncritical states of mental security.

When one speaks of state medicine, for example, every one knows we have what is tantamount to state medicine in psychiatry. The greater part of all psychiatry in America is state-organized and state-supported. State psychiatry in the last 80 years is a field that has shown magnificent progress. Our universities and our general hospitals would do very well by themselves if they would see their way clear to follow the example the separate states have set (New York, Massachusetts, Illinois, Ohio, Pennsylvania, to name a few) in the understanding and care of the mentally ill, for no one denies that colleges and general hospitals contain many "well" or "sick" individuals who are basically unstable, maladjusted and headed for breakdowns that may be preventable, and that does not exclude the faculty or the visiting staffs of these institutions.

Even from the vantage point of a private practice, the psychiatrist can see the great need and the great opportunity for constructive work if mental hygienic or psychobiologic attitudes were more commonly accepted and practiced in universities and in general medicine.

In the private practice of psychiatry one is automatically and largely relieved of a great part of routine work by the excellent systems of state care that afford examination, diagnosis, custody, treatment and after-care through the offices of state departments of mental health and various private institutions. This is as it should be. Only a small part of the general population is able to afford (or should be expected to pay) the expense necessarily associated with private psychiatric care. Apart from consulting work and continuous cooperation with the state and other institutions, the patients a psychiatrist sees in private practice are automatically sifted by an economic sieve. The psychiatrist who is practicing privately as a rule is able to accept for treatment only those patients who are able to afford private care, and that is the second rub. The problem of the cost of medical care is as acute an issue in the private practice of psychiatry as it is in medicine or surgery and, alas, neither public opinion nor general facilities as yet are well prepared to care for mentally ill patients, compared with those who are ill with other medical and surgical disease. But that condition is improving as interest grows among internists and socially minded persons who are increasingly concerned over the problems of psychological medicine, and leaders who are coming to know more about the psychiatric point of view.

But increasing facilities do not prevent this from being a problem: in private psychiatric practice one does see a goodly number of patients who are badly in need of help and who might be helped by psychotherapy but who cannot afford the expense of private psychiatric treatment, be it ever so little, and for whom no public facilities are available. In Boston, for example, there are two or three places where free or minimal cost psychiatric care can be obtained but these clinics are crowded and have long waiting lists and are often unable (though they do the best they can) to give the amount and kind of individual attention that the patient needs. This is discouraging to the patient and to the physician. There are relatively few psychiatrists and an excess of patients in need of psychiatric help to be found in every community. Clearly the answer is more psychiatrists but where are they coming from and who is going to pay

them? The problem is not solved by volunteer work in the psychiatric out-patient clinic (volunteer on the part of the psychiatrist and free to the patient), and this problem can probably not be solved by lay therapists and it is not yet solved by group therapy. The problem is not solved. Possibly it may never be. It is possible that no state can afford to give everyone the ideal or even optimum amount of psychiatric guidance or therapy that might theoretically be needed. There is a pressing and growing need for psychiatric out-patient clinics and services in general hospitals, where psychiatric diagnosis and psychotherapy might be available free or at moderate cost (if this is economically possible). I, for one, believe it should be tried, especially for "worth-while" cases.

This painful situation has led the psychiatrist (who must be reasonably self-protective) into a somewhat realistic attitude towards therapy. Naturally he must be to some degree selective in those cases he accepts for treatment. That is why practicing psychiatrists and psychotherapists prefer to work with patients who have some life ahead of them, patients who are intelligent and cooperative and who want to get well. No psychiatrist, except by the expenditure of massive effort makes much progress with patients who have lived their life, who have rigid personalities, who are resistant to therapy and "cling to their neuroses."

Even with present day knowledge, with all the machinery and information that support modern medicine, the psychiatrist in the last analysis after laboratory work, after drugs and techniques (after the captains and the kings depart), works with the patient and by himself, with ideas and with words—and with feelings.

Broadly considered psychotherapy has advanced very little in recent years. Modern eclectic methods are surprisingly like those described by Bernheim, DuBois and Janet. The modern books by Schilder, Diethelm and others are more surprising in their rearrangements than in their contents. Except for the advances of Freud, Adler and Jung, the technical implements of modern psychiatry are little modified from those of the nineteenth century. Most modern psychiatrists (irrespective of the *school* to which they may "belong") use, when and as they see fit, whatever procedure they feel may benefit the patient. The Adlerian and Jungian "methods" if they may be called such, are essentially analytical and if conflict should ever arise over the use of that word (as if it were copyrighted) they might then be described as being *random* as compared with the more *organized* Freudian method. Today there are many excellent men who confess to describing themselves as *Freudians,* but as time goes on and as medicine progresses and takes unto itself the corpus of what is valuable in any "school" or "method" it may become with Freud as it is with Darwin; once there were many Darwinians but there are few Darwinians today.

Above the dust and smoke raised in the foreground by the champions of various "methods" one can see only two main types of psychiatric therapy (apart from drugs and physical means of treatment). These are the repressive and inspirational type on one hand and the analytic on the other. The great problem in therapy really is: which of these methods in the long run is best for the individual patient. Sometimes the psychiatrist cannot decide. It may appear that one would be best but the method attempted sometimes fails. Clearly there are some situations where *no* therapy is advisable—where it is best to let sleeping dogs lie and to try not to wake them. Certain cases clearly are in no way helped by any sort of light or "superficial" treatment and respond much better over a period of years to treatment that is prolonged and intensive. In this matter, I believe the psychiatrist is wise who knows what is wrong with the patient and what type of treatment is best for him. And that is a point where I personally have come to have enormous respect for the person who knows the patient best, and for the opinion of the family physician and for the advice in consultation of older and more experienced psychiatrists. Something of wisdom does adhere to them by accretion through the years. And beyond that one cannot say much in general.

In private psychiatric practice one notes and one is grateful for the widening interest

in this field that is springing up on every side. One realizes too, that a need exists to teach all those who look to psychiatry and psychotherapy for help—to teach them more about what can be expected and something about the limitations lest the commodity be over-sold and the consumer be disappointed. The ancient warning needs emphasis here: let the buyer beware. Physicians, for example, need to know more about the type of cases they can refer to psychiatrists with reasonable expectation of improvement, but this will take time.

With all this panorama and with all these anticipations there are some bright spots especially in the quarter devoted to pharmacology and biochemistry. I choose to close by calling them to your attention. There is the new sedative for use in epilepsy: dilantin. There is the new drug amphetamine sulfate for use in depressive and narcoleptic and alcoholic states. There is the new drug sulfanilimide with its numerous uses, many of which are not yet explored. There are the new uses for insulin and metrazol, to name a few. The pharmaceutical horizon as far as the practice of psychiatry is concerned, and the treatment of nervous and mental disorders, is brighter and more hopeful than it has ever been before in the history of medicine. One should mention also vitamine therapy in psychiatry, cevitamic and nicotinic acid and their derivatives, for example. And, as ever, there are the valuable old stand-bys among the sedative and analgesic group, the salts of bromide and acetyl salicylic acid without which the symptomatic treatment of many nervous conditions would be unnecessarily difficult. There are of course insulin and metrazol. Then there is the ever widening scope of occupational therapy and (as Menninger has pointed out) there is bibliotherapy. The use of books, articles, autobiographical sketches and written reports, as well as conferences with relatives and informants, is extremely important in the private practice of psychiatry where often methods not quite orthodox must be employed especially when the patient is at a distance or may live in isolated rural districts or can visit the therapist infrequently. Many patients gather a great deal that is psychotherapeutic from reading and a large amount of psychiatric treatment of a sort that is sometimes surprisingly effective can be carried out indirectly with the assistance of others, those who are in contact with the patient.

Possibly a word might be said about one striking deficiency in private psychiatric practice; the assistance of social workers is needed, or their equivalents. Many are the times when, in private practice, I have yearned for the aid we receive as a matter of routine in the Boston City Hospital from our department of social work, or the department of hydrotherapy or physiotherapy. To some extent, in some communities these deficiencies can be made up by existing facilities.

Swimming, sea bathing, sun bathing, all sports and occupations have a definite and valuable place in the psychotherapeutic regimen. Also I should mention here the value of almost any form of study (or collection) of natural science objects: sea-shells, land-shells, fossils, minerals, plants and animals, and elementary instruction in all the basic sciences. Each of these has its place as a form of occupational therapy, or as an adjunct to psychotherapy (informal of course) or just as a normal healthful constructive human interest or personal hobby. Even so humble a pastime as walking or gardening has been curative in some instances. It is possible that any activity that in any way gives a mentally ill person satisfaction, or helps make him feel or be more useful may, in a not too obscure way, do something to restore an internal equilibrium in the forces of his personality, or may help him achieve a more satisfactory balance in the distribution of his energy and his interpersonal relationships. Possibly some of the factors that precipitate or relieve neurotic symptoms may be simpler than one might suspect. In certain instances it would appear so.

A few general points about private practice might be mentioned in closing. One has to deal with the need for therapy as it arises. One usually has to work *from* the complaint *to* the problem giving rise to it. Most important in the beginning is the establishment of the rapport. The doctor has to know (or take into consideration) how the patient

is thinking or feeling towards him as well as in general or the therapy will not proceed easily. The examination is usually less formal in private practice. Some procedures have been described as "working from the ego down." Two decisions have to be made very quickly in individual cases:

1. Whether the approach should be made to the patient's problem by way of his emotions or by way of his intellect (often the beginning of treatment is like offering a child candy) and

2. Whether the problem should be dealt with repressively or analytically. In most private psychiatric practice of the ordinary garden variety I find that the majority of cases react more favorably when dealt with repressively at least until a rapport is established and the patient begins to collect some assurance and insight.

In the mind of every psychiatrist engaged in private practice two hopes constantly exist. Both arise from a certain discouragement or frustration the psychiatrist himself may feel at times from working with adults or older patients. There is an awareness that his work is restitutional, that it is "a repair job" at best and that something should have been done about the difficulty long ago, or earlier. And the other feeling is that those who were in charge of the patient at an earlier date failed to recognize or deal with the difficulty at stages in its development when it was most susceptible to favorable influence. Here are the two hopes these feelings give rise to: *first* that parents, nurses and teachers in primary and secondary schools may come to learn more about the children in their charge so that the personalities of these children may be less damaged in their development (what happens I do not know, or how it happens, but it is a fact that one does see little boys for example from 4 to 8 years old who are more manly then than they ever are again in their lives) and *second* that teachers in high school and college and those under whom young people serve their apprenticeships could do more to help them prepare themselves for living, for marriage, for being happy and useful, instead of giving them the veneer of formal education. Into the sea of criminality, delinquency, alcoholism, addiction, perversions, neurosis, psychopathy and psychosis one sees vast streams of human energy poured and wasted. Much of this waste may be unnecessary and preventable. Surely through the practice of psychiatry more can be done than we are now doing to bring about more organization and proper orientation of the forces in our patients' personalities, and some release from the conflict and unbalance in their lives. By diminishing sensitivity where oversensitivity is a problem, by increasing insight where lack of insight is a problem, with growth and integration where immaturity and disintegration were the problems and through education and guidance where ignorance and misdirection were the problems, much can be accomplished.

If this is true, it must also mean that the psychiatrist in his private practice must be a part of the community in which he lives, or must at least know it very well and he must be very familiar with its resources, the schools, the ministers and industry. In a word, he must himself belong to the community or he cannot be very effective in his educational and preventive rôle, or as a therapist in the broadest sense.

The opportunities for constructive work are what make the private practice of psychiatry so satisfactory, and it is the number of patients one sees who need help, that one cannot help that make it so unsatisfactory. That is the paradox.

DISCUSSION

Dr. Harry Stack Sullivan (New York, N. Y.).—I wish to say firstly how particularly timely it is that the Association should hear this year a symposium on community psychiatry. It seems to me that the changes being initiated in the American cultural scene and which will presumably gain momentum from here on, call for an expansion of the psychiatric viewpoint very definitely from our present preoccupations into those of the community in which we live.

As Dr. Moore has said, psychiatry is a state function which has not only antiquity and high efficiency, but extreme significance in a situation in which there is great and unpredictable change. I believe that psychiatrists have the capacity to deal with the extraordinary struggle undisturbed and better than any other group. There seems very little room for optimism as to our standards of living from here on. Life is going to become harder and more problematic, and the need for psychiatry in the community is going to increase.

It seems to me that community psychiatry must be expanded as rapidly as it can be with reasonable safety; that we may make many mistakes seems quite unimportant, as long as we have more successes than mistakes. There isn't time to be unduly safe and careful now.

We do not know very much about our communities. Our medical schools taught us nothing about what is significant in the construction of the community. We have impressions, some quite erroneous, as to the agencies which can be turned to the purposes of psychiatric treatment. Many of us are as carefully withdrawn from the community as we can be. Many institutional people find the community more a burden than anything else. But our state hospitals are not going to be expanded and built in great numbers from now on, although the problem of the seriously disordered is going to increase. State Departments of Mental Hygiene must turn more and more to the problem of psychiatric care in every community without employing great numbers of psychiatrists and without great hope of having large numbers of social workers and other expensive technicians.

If my picture of the future is correct and if social disorder is going to increase, we shall have to become better equipped to understand motivation and to provide recreational and other outlets for troublesome emotions, and better equipped to recognize and deal with evil tendencies in minority groups.

We cannot do these things by sitting in our offices and trying to think in terms of paranoid tendencies and psychopathic conditions and manic excitements, as we are accustomed to thinking in the clinical conference. We have to think more in terms of what goes on between people in the issue of their every-day lives, having in view the broadened perspective of actual community psychiatry.

We shall be entering a very risky field, but I believe there is no one else to enter it, and that if no one does enter it, if it is just left to chance, we may well despair for those who will follow us, because I am afraid that they will enjoy none of those advantages that have led to the wonderful development of psychiatry in these United States.

Dr. Karl A. Menninger (Topeka, Kans.).—We psychiatrists bend our efforts, in theory at least, to help people accept reality, and yet I sometimes have the impression that we ourselves are exceedingly unrealistic. It seems to me that there is one aspect of the subject which was touched upon by Dr. Ackerly and by Dr. Moore but which deserves a great deal more emphasis. I refer to the question of economics.

As I listened to the very excellent papers in this symposium, I kept saying to myself, "Who pays for all this?" Of course we believe that it is a good investment, but who makes the capital investment? It seems to me that we sometimes accept it as self-evident that these services will be provided by the state or the county or somebody, if we show them that it is desirable.

I am not certain that we ought to take this for granted, and as a psychiatrist I am concerned about the psychology of giving people something for nothing, thus continuing the illusion that nothing costs anything, providing you can get the government to pay for it.

In the extremely interesting paper of Dr. Ackerly's, in which a psychiatric clinic's usefulness was described, the word "clinic" was constantly used in a slightly ambiguous sense. I wasn't sure whether the Doctor referred to the clinic as a cooperative group of physicians, psychiatrists, psychologists supplementing one another's efforts, or as a place where people could get free treatment because a number of doctors were on the payroll of the city. The word "clinic" is used in these two different senses, and I think it is wise to differentiate them.

This is introductory to the more general idea of what we conceive psychiatry to be. Is it true, as Dr. Moore indicated, that psychiatry is either on the one hand a luxury specialty for the rich or on the other hand a service for paupers administered by the state and federal government, or occasionally by the community, the city government? I didn't hear in any of these papers what it costs the individual, what he pays and what we pay out of our taxes to this individual. We have here two different philosophies. One idea is that the community is responsible for the mental health of anyone who doesn't make the grade and that all should contribute to a pot in order to help him. The other assumes that the individual himself has a certain responsibility for his illness and, therefore, for his treatment.

I don't know what the answer to this is. I am in the private practice of psychiatry, and everyone in private practice is aware of the unpleasant situation

of being dependent upon people of better than average means for one's living. We don't like that, but what can we do about it? Many of you are employed by the state. You may or may not like it, but what can you do about it? I don't know what you can do about it, but at least we can begin to think about it. The medical profession has delayed over long to consider this question of the economics of medicine.

There is the dilemma of the great middle class, the white collar group who do not get sufficient psychiatric treatment. They cannot come to the community clinics without sacrifice of pride. They go to the state hospitals, but they do so on a certain semi-pauperization basis in theory, if not in fact. The private institutions are all too expensive. We know they are too expensive, but private institutions are also in the economic system. They struggle in a tremendous and increasingly difficult conflict with the law of supply and demand, with the result that no private institution at the present time is economically very successful or even, I may say, successful.

Therefore, this is a very acute problem, not only for psychiatry generally but for every one of us who is in private practice.

What are the needs and wishes of the middle class of people with regard to psychiatric treatment? In a very earnest effort to find out we once offered at our institution for a time (we still offer as a matter of fact) a so-called mental hygiene service at a very low rate, $3 for a consultation, less than they would pay the average general practitioner for the same length of time. We thought we would be flooded, but almost nobody took advantage of it. Everybody knows about the availability of this service, but I am not so sure that the middle class wants psychiatry.

Now one final point. It is frequently pointed out that psychoanalysis which is a technic of major psychotherapy takes too long and costs too much. Of course it does. So do many orthopedic procedures; so also the treatment of tuberculosis costs too much and takes too long. I think we should look forward with a great deal of interest to possible methods of abbreviating psychotherapy.

In concluding my remarks I feel that there is a great deal about community psychiatry that we don't know. The fact I myself would like to know a great deal more about is this: What is the proper method of distributing the cost and who pays it? It seems to me that question ought to have a symposium next year.

DR. WALTER L. TREADWAY (San Francisco, Calif.).—I was very much intrigued by the title chosen for this symposium—Community Psychiatry. I was intrigued because the title is a challenge to what we might discuss as the scope of psychiatry. We have come to recognize that health is more than the mere absence of disease. It means satisfaction, contentment, joy, and effectiveness which are components of positive health. Any health program must take into account those factors as complementary ones in adopting measures and policies for the conservation and the promotion of positive health.

Now physicians deal largely with the negative aspects of health, but a knowledge of ill health necessarily implies a knowledge of good health. Therefore, physicians are in an enviable position with reference to measures for the promotion of the positive aspects of health.

Of psychiatry one can say that it is not only a specialty of medicine but that it is an aspect of all medicine.

We learn also from the discussions today that there is need for a greater expansion of behavior clinics and other measures in the community for dealing with psychiatric problems; and we gather the lesson that psychiatry is an aspect of all social welfare work.

We are reminded further of the need for considering measures which will help in the solution of the economic problems associated with mental illness.

Most of the papers this afternoon have dealt with measures for the correction of adverse mental states. One may ask whether our knowledge of man and his needs has not progressed sufficiently to permit something to be done to promote the positive aspects of mental health, the positive aspects of community psychiatry.

If we departmentalize a community organization, we shall find certain functional activities which correspond with the biological needs of man. One of those activities relates to the obtaining of sustenance, the business of getting a living, and this activity has created many issues which are crying for solution. The second great function of community life is that of personal emancipation and the development of family. The third relates to the training of children in what to do and what not to do. The fourth is concerned with the regulations of the activities of the community as a means of individual and collective protection. The fifth functional activity of community life relates to religious endeavors of one kind or another, and the sixth concerns the uses of leisure time and opportunities for relaxation and recreation.

In this departmentalization of community life is it possible that modern psychiatry can make some contributions to the great issues involved, contributions to the promotion of health and the prevention of breakdowns? Is it possible that it can make some contributions to education on the positive side, to improvement of family relationships, to wholesome uses of leisure time?

In this complex of functional community activities man is largely technic-bound. He has lost sight of human needs in many respects and he is influenced a great deal by his own prejudiced feelings with reference to the business of getting a living, the technic-bound aspects of the law and of education, the technic-bound aspects of religion, or perhaps religion is now seeking for new technics, and the technic aspects of play, which is so often of a vicarious or passive nature. Is it possible that with our present knowledge of man psychiatry can

help to overcome these technic-bound aspects of the departmentalization of community life?

Dr. Karl M. Bowman (New York, N. Y.).—Our discussion this afternoon has sought to emphasize the idea that psychiatry no longer is confined to institutions, isolated and out of contact with the rest of the community. We realize that psychiatry has infiltrated all other branches of medicine and that the psychiatrist has become a member of the community instead of living apart in institutions. In private practice he is in much the same situation as other specialists.

General hospitals now recognize the need of specialists in psychiatry just as in other fields. We now have psychiatric clinics in connection with general hospitals just as we have eye clinics, skin clinics and other special clinics. In considering the problem of psychiatry outside of the institution we are focusing our attitude somewhat, realizing that all mental patients do not need institutional care, that it is physically and economically impossible to give such care to all mental patients and that we must, therefore, develop technics and methods within the community for handling a great percentage of our mental cases.

As was brought out by Dr. Humphries we can never hope to care for most of the mental defectives in institutions. We must always expect to have the vast majority of them in the community, and we must educate the medical profession and the public to this idea. They must not think that every time a diagnosis of mental deficiency is made the only answer is to put the individual in an institution.

Likewise it must not be thought that the fact of mental illness necessarily means institutional care. We have not yet done much about making use of the community resources and educating the public generally in the handling of patients outside of institutions. It was with that idea in mind that we organized for this year this symposium on community psychiatry. We wished psychiatrists to start thinking about these problems, and I am sure that after listening to the discussions this afternoon you will realize that we have not yet achieved the solution. This is our task as psychiatrists to undertake, because no one else is going to do it.

Dr. S. W. Weltmer (Catonsville, Md.).—I would like to ask Dr. Molholm what arrangement they made about boarding their patients, whether patients who were moderately productive caused the expense to the state to be reduced to correspond with their productiveness, or whether the caretaker was paid a full stipulated amount for all patients.

Dr. Hans B. Molholm (Worcester, Mass.).—I had purposely refrained from saying anything about the cost of family care because there is still some question about its actual cost. All the published data are to the effect that family care costs less than care in hospital. Critics say that certain administrative costs have not been included in the data and, therefore, the data are invalid. I think we can say that family care probably does not cost any more than care in the hospital, and if we take into account that new buildings do not have to be built for patients in family care, then it probably costs less.

In the early days of family care in Massachusetts, much attention was paid to balancing the amount of work done by the patient and the amount of board paid. That was in the days when family care was set up for the chronic, quiet patient who had no place to go. He was harmless, he stayed in these family care homes for years. At present, there is no adjustment made because the stay is indefinite. As I pointed out, we now stress the use of family care for earlier and convalescent cases. These patients have the privilege of getting work outside the home, and they do so. Thus they become more self-reliant and eventually are able to take care of themselves and are discharged.

Dr. Merrill Moore (Boston, Mass.).—I would like to say a word or two in closing, Dr. Bowman, first to thank you for the opportunity to bring up these questions on the cost of psychiatric care. Much has been said about the cost of medical care but we have been dancing a courtly minuet around the psychiatric problem, largely ignoring it.

I am prepared to state the cost of epilepsy in Massachusetts. The care of epileptic patients costs the state more than one million dollars a year and certain epileptic patients during their lifetime are known to have cost the state more than $8000 at the rate of $200 or $300 a year.

Not only does this question bear directly on economics but it bears importantly on nutrition. There is a very close relationship between economic problems and nutritional problems.

Dr. Menninger's comments are extremely pertinent and synthesize much we are thinking on this subject. I echo his feeling that next year, if we meet next year, these questions can be further discussed. They are all extremely important because of the natural anxiety the public is beginning to feel over the international situation.

SELF-INFLICTED BULLET WOUND OF FRONTAL LOBES IN A DEPRESSION WITH RECOVERY

A Psychologic Study [1]

By ZIGMOND M. LEBENSOHN, M. D., Washington, D. C.

Since the earliest dawn of medical science, accidental ablations of parts of the central nervous system have been a rich source of material in studying the function of these parts. Wounds and injuries of the brain have always attracted much interest because of the light they throw on the localization of function.

Of all parts of the brain the frontal lobes, by virtue of their location, are most susceptible to injury, whether by accident or suicidal intent. The mental symptoms following frontal lobe injury attracted attention long before the effect of frontal lobe tumors was studied. It is noteworthy, however, that practically no recent cases have received adequate psychologic investigation. Trousseau(1) in 1864 reported the case of a man he treated in 1825 as an intern. This gentleman received a bullet wound in the temple during a duel. He recovered shortly and lived with the interns of the hospital for five months, amusing them with his mirth, gaiety and vaudevillian antics. A brain abscess which developed at the site of the bullet wound abruptly terminated his euphoric career.

Perhaps the most famous case in recent times is the celebrated American crowbar case reported by Dr. Harlow in 1868(2). The case is of sufficient historic interest to merit citing a few of the details.

In 1847 Phineas Gage, a 25-year-old foreman on the Rutland and Burlington railroad, was sitting on a shelf of rock tamping a load of dynamite with a heavy iron rod 3½ feet long, 1¼ inches in diameter, and weighing 13¾ pounds. The charge exploded and drove the tapered point through his head, the bar landing several rods away covered with blood and greasy to the touch. The missle entered the left side of the face immediately anterior to the angle of the lower jaw and passing obliquely upward and backward, emerged in the median line near the coronal suture. (Figs. 1, 2, 3.)

"The man was thrown on his back by the explosion and gave a few convulsive motions of the extremities but spoke in a few minutes. The men, with whom he was a great favorite, took him in their arms and carried him to the road only a few rods distant and put him into an ox-cart in which he rode supported in a sitting posture fully three quarters of a mile to his hotel. He got out of the cart himself with a little assistance from his men and an hour afterwards . . . . he got upon the bed in the room where he was dressed. He was perfectly conscious but was becoming exhausted from the hemorrhage which by this time was quite profuse. He bore his suffering with fortitude, directed my attention to the hole in the cheek saying, 'The iron entered there and passed through my head.' The patient made an excellent recovery although it was noticed that he became quite capricious, childish, and extremely obstinate. He applied for a situation as a foreman but . . . . his contractor, who regarded him as the most efficient and capable foreman in their employ previous to the injury, considered the change in his mind so marked that they could not give him his place again. The equilibrium of balance, so to speak, between his intellectual faculties and his animal propensities seemed to have been destroyed. He is fitful, irreverent, indulging at times in the grossest profanity (which was not his previous custom), manifesting but little deference to his fellows, impatient of restraint or advice when it conflicts with his desires, at times pertinaciously obstinate, yet capricious and vacillating, devising many terms for future operations which are no sooner arranged than they are abandoned in turn for others appearing more feasible. A child in his intellectual capacities but with the general passion of a strong man. Previous to his injury, although untrained in school, he possessed a well-balanced mind and was looked upon by those who knew him as a shrewd, smart businessman, very energetic and executing all his plans of operation. In this regard his mind was radically changed so that his friends and acquaintances said that he was no longer Gage."

It would be difficult to find a more accurate description of the changes in personality occurring following frontal lobe damage.

Even lay observers have commented on the marked personality changes following destruction of the frontal lobes. Peter Freuchen(3) in his fascinating book *Arctic*

[1] From the Department of Neurology, George Washington University Medical School and St. Elizabeths Hospital, Washington, D. C.

Adventure describes the old Eskimo, Agpaleq, whose gun exploded in his hand while shooting caribou and who sustained a massive destruction of the frontal lobes of the brain. The left frontal bone was shattered and about a cupful of brain matter had come out.

"They cleaned out more with a spoon, after which Aloquisaq sewed the skin together. . . . Agpaleq's recovery was slow, but almost complete. The accident resulted in peculiarity of habits rather than invalidism. During the remainder of his life he could sleep for a week or more at a time, and remain awake an equal length of time. When asleep, it was almost impossible for him to be awakened, and it became quite the custom for his neighbors to walk into his house and help themselves to whatever they might desire, including his wife. Agpaleq slept soundly through it all and never knew what practical jokes were played on him.

"He also became almost unbearably dirty, soiled himself and never cared. Prior to the accident he had been neat and clean, but afterward he was always smeared with grease or blood or both. His hands were filthy, his toes rotted away and filled the house with the most noisome stench. He could still hunt in his kayak, for he retained his heels and half of his feet, and was useful until the time of his death, after which his wife came to us and brought her son with her."

Although there are many references to such psychiatric changes in normal persons who have had accidental destruction of the frontal lobes, there are comparatively few studies of mentally abnormal or depressed individuals who have injured their frontal lobes in a suicidal attempt. Perhaps this is because these attempts are too often successful. De Nobele(4) in 1835 reports a case of a foreman who was described as a melancholy dreamer and who attempted suicide over an unrequited love affair. He shot himself in the left forehead leaving a large cavity in one frontal lobe. Following the attempt, he became intelligent, gay and industrious, stopped his dreaming and improved his business by great application to his work.

Phelps(5) in his series of 28 cases of gunshot wounds of the head, first published in 1897, concluded, but from inadequate study, that the left lobe was the most important in the production of mental aberration. One of his cases is interesting enough to be quoted here.

CASE 299.—"A white female, aged 28, shot herself in the right temple in a suicidal mania and recovered. There had been no indication of any form of mental impairment at any time since the slight hebetude on the second and third days. At the end of three months her mental and physical condition was normal, in her own opinion better than before the injury was received. One year later the recurrence of her malady necessitated the return to an asylum for the insane."

In 1904 Dr. W. F. Lindsay(6) of Topeka, Kansas, reported a remarkable case of a young man who shot himself through the temples, nicking the corpus callosum. He writhed on the floor for five minutes and then got up.

"He seemed very reticent on being questioned although he talked enough to show mental coherence. He made a quick recovery and four months later learned telegraphy, rising to be manager of a railroad office. He later became a gunnery sergeant and was severely wounded in France. In 1922 he again shot himself and died in his hotel room. His sister writes that he left a letter in which he 'stated that he had no wish to live a life of suffering or to become a helpless cripple.' At no time during the years following his first injury did he show any 'brain symptoms' of irritability, sullen moroseness or excitability. We regarded him normal in every way."

One fact which strikes the observer as being more than coincidental is that in almost all cases of self-inflicted gunshot wounds of the head with amelioration of the depressed emotional state, the site of the lesion is in the frontal lobes. It is in an attempt to evaluate the specific rôle the frontal lobes play in such dramatic improvements that the following case is cited. This patient came to the writer's attention while she was a patient at St. Elizabeths Hospital and I am greatly indebted to Dr. Winfred Overholser, Superintendent, for his kind permission to make use of the clinical records.

The patient, Mrs. M., aged 49 at the time of the shooting, was a prematurely gray haired, matronly woman, the wife of a professional man. Aside from an alcoholic father, there were no psychopathic determinants. She had a previous marriage at 16 which was of very short duration and was terminated by divorce. She had some training as a nurse and met her present husband while attending the first Mrs. M. who died of a cerebral accident. Following her marriage in 1914 she made an excellent home adjustment for 16 years. There were no pregnancies by either marriage. She was a good

housewife; tidy, but not over-meticulous, industrious, economical and sociable. Both Mr. M. and his wife drank in moderation but in 1930 the patient began drinking heavily. She became tense, depressed and unable to sleep. In addition to the alcohol, cigarettes and veronal were also used to excess. Menopause in 1931, litigation over a serious auto accident in 1932 and worry over a severe hypertrophic arthritis which began in 1935 all deepened her depression. She cried frequently, showed agitation and was frequently preoccupied with suicidal ideas. She made an unsuccessful suicidal attempt in 1936 by taking an overdose of morphine and made frequent other suicidal threats. Attempts to help her by keeping her occupied failed because of her depressed spirits, her instability and her alcoholism.

On May 25, 1937, following a trivial argument with her husband, the patient became very depressed and shot herself through the right forehead (Fig. 4) with a .25 caliber pistol. She was taken immediately to Emergency Hospital where she was perfectly conscious, oriented in all spheres and neurologically negative. X-ray films revealed a fracture of the right frontal bone extending from the stellate wound of entrance in two directions; upwards toward the brow and downward to the floor of the anterior fossa. She had persistent and copious rhinorrhea. Her right eye became enormously swollen, inflamed, proptosed and was enucleated. After five weeks, she was sent home with a nurse somewhat improved. She was no longer depressed but she showed judgment defects and became so unstable and difficult to manage in regard to her alcoholism that she was admitted to St. Elizabeths Hospital July 30, 1937.

In the hospital she showed some equivocal transient neurological signs all of which completely disappeared in nine days. She was still leaking cerebrospinal fluid and X-ray films taken August 5, 1937, seventy days after the shooting, showed a spontaneous pneumoventriculogram with markedly dilated ventricles, a large pocket of supracortical air over the left frontal region and the bullet resting over the roof of the left orbit pointed to the right (Figs. 5, 6). X-rays repeated at intervals showed gradually decreasing quantities of air, and by January 26, 1938, no air was present.

Psychiatrically she was at first uncooperative, childish, manneristic and euphoric. She made many silly jokes and laughed uproariously over them. For example, she said she had come to St. Elizabeths because she was expecting a baby in September. No hallucinations or delusions were present. She scored 12 years 7 months on a psychometric examination performed 5½ months after the shooting. It was the opinion of the psychologist that she had always had a meagre endowment and had been functioning well for years on a comparatively low intellectual plane. She was allowed to go home on visit in January, 1938, after six months in the hospital. At that time her husband stated that there had been a definite change in her character and that she was better than she had ever been since he had known her. One of the staff physicians facetiously commented that the patient had cured her depression by performing a prefrontal lobotomy on herself. Although there was no recurrence of her depression and no repetition of suicidal attempts, the patient continued to drink, smuggling whisky past the maids and housekeepers by various strategies. On April 1, 1939, almost two years after the shooting, she had her first and so far only convulsive attack. There were eight severe seizures in a row and she was sufficiently impressed to reduce drastically her alcoholic intake.

Present Status

At present, over three years since her almost fatal suicidal attempt, she is a well composed, neatly dressed woman, with no gross psychiatric symptoms, taking care of her house, and, aside from occasional overindulgence in alcohol (which is diminishing), making a good adjustment. Closer examination reveals a characteristic lack of restraint, and facetiousness in her comments. After meeting one of us (Dr. Freeman) in a rather formal office setting, she immediately commented on his beard, "Boy, that beard would make a good bird's nest!" and laughed explosively over her remark. There was no recurrence of her depression and she has had no desire to make any further suicidal attempts. In retrospect she rationalizes her previous attempt by stating she was depressed over her arthritis. In this connection, it is interesting to note that although her arthritis is now much worse, she worries about it less.

The Kent Rosanoff word association test (Appendix I) revealed a predominance of common reactions but there were also a number of individual associations accompanied by great outbursts of laughter. For example, the word *boy* brought forth "gal" plus a chuckle. To the word *religion*, she answered "none" and roared. To the word *head*, she replied "brain," adding "if you've got any," and then spluttered in a highly amused manner. The time consumed for the test was 9 minutes which is somewhat less than average. Her associations were prompt and crisp, and even the individual responses were well within the normal range.

Reaction to the Rorschach test (Appendix II) was punctuated by many facetious and irreverent comments. On looking at card III she said, "I think this is kind of dumb if you awsk me!" (Laughs heartily.) She gave 18 scorable responses, which is far below the average (about 30) for normal subjects. Most of these showed poor regard for form (F — =66 per cent) indicating intellectual flightiness. There was complete absence of *d* responses hinting at a lack of distractability by small details. The large percentage of *D* responses showed a reaction to the simple and obvious. The presence of color response (c) and complete absence of movement (M) is suggestive of a person with low creative activity but with considerable capacity

Fig. 1.

View of the tamping iron, and front view of the cranium, showing their *comparative* size.

Fig. 2.

Front and lateral view of the cranium, representing the direction in which the iron traversed its cavity; the present appearance of the line of fracture, and also the large anterior fragment of the frontal bone, which was entirely detached, replaced, and partially re-united.

Fig. 3.

View of the base of the skull from within; the orifice caused by the passage of the iron having been partially closed by the deposit of new bone.

FIG. 1, 2, 3.—Drawings illustrating Harlow's famous crowbar case.

FIG. 4.—Right profile view of patient showing site of entrance of .25 calibre bullet. (black spot)—The right eye was enucleated and replaced by an artificial eye.

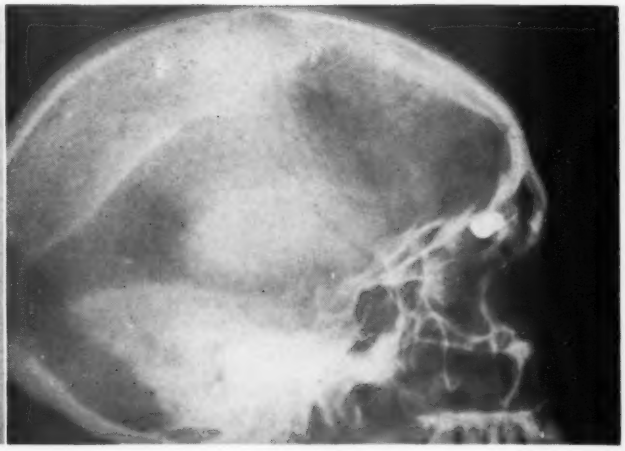


FIG. 5.—Left lateral view of skull showing spontaneous pneumoventricle, markedly dilated ventricles, large pocket of supracortical air over the right frontal region, fracture of the right frontal bone, and the bullet over the left orbit.

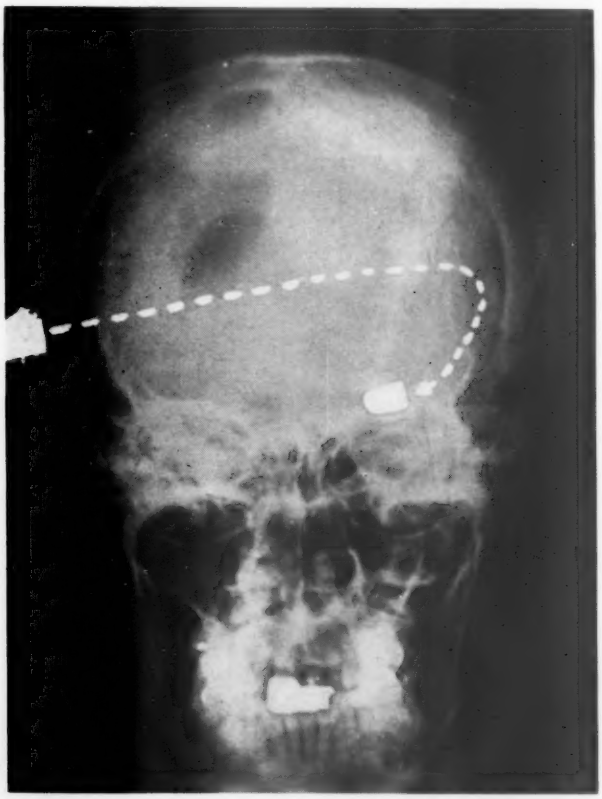
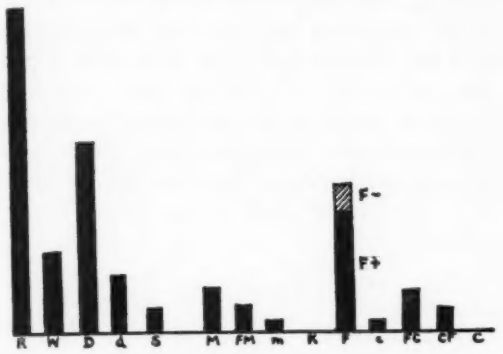


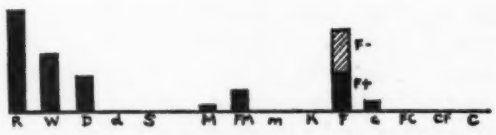
FIG. 6.—P. A. view of skull showing dilated ventricle on right and bullet over left orbit; nose pointing to right. Conjectural course of bullet shown by white dotted line.

for affective experience. There was marked limitation in the scope of her associations and many of the whole responses (of which there was a large number) were vague, such as clouds, maps, rugs, etc. The test showed a definite tendency toward the extraversive type of personality, with rather mediocre intellectual equipment and background.

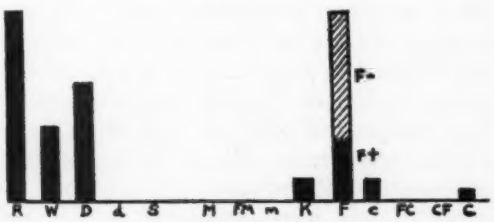
Fig. 7c is a graphic presentation of the patient's psychogram. When compared with the "hypothetical normal" (7a) and composite frontal lobe case (7b) according to Harrower-Erickson (7) the reduction in total responses and the low F + percentage is striking.



a. Hypothetical normal (after Harrower-Erickson).



b. Composite preoperative frontal lobe tumor case (4) (after Harrower-Erickson).



c. Mrs. M.

FIG. 7.—Comparative Rorschach records for hypothetical normal, frontal lobe tumor cases and the patient, Mrs. M. (Hypothetical normal and tumor cases after Harrower-Erickson (7).

With the assistance of her husband a comparison was made between the patient's present status and her condition prior to the shooting. Her worrying, indecisiveness and alcoholism have remained more or less unaffected. On the other hand, her depression, her suicidal ideas and her over-meticulousness and panic have been greatly relieved. Somatic symptoms produced included gain in weight (20 pounds), increased appetite, convulsions (one attack), rectal incontinency (transient) and vesical incontinency (transient).

On May 14, 1940, the patient was examined before the Commission on Mental Health, dropped from the rolls of the hospital and her full civil rights restored. It is interesting to note that the patient made all the necessary arrangements, including the notification of both medical and lay witnesses, showing intelligence and good judgment throughout.

DISCUSSION

This unusual case invites discussion from various angles. First, there is the question as to how much brain damage actually occurred and where the destruction was chiefly localized. This could best be determined by studying the path of the bullet. As can be seen from the PA view (Fig. 6), the bullet entered the right temple and is now lodged in the left supraorbital region just back of the frontal sinus with the rounded and undeformed nose pointing toward the wound of entrance. In other words, the bullet must have turned around at least once in its course. The exact course of any bullet through tissues of varying resistance is always conjectural. Dr Magruder MacDonald, the district coroner, who was kind enough to examine carefully the plates is of the opinion that the bullet coursed upwards through both frontal lobes, losing speed rapidly, and on coming in contact with the dura of the opposite side was deflected, turned down and reversed its direction to lodge finally above the left orbit.

The amount of destruction of brain tissue is also determined by the closeness of the muzzle to the temple at the time of firing. In this case the muzzle was held in contact with the skin, as evidenced by the jagged wound of entrance. In this position great damage is produced by the explosive gases which precede and follow the bullet.

The rhinorrhea is easily explained by the fracture of the floor of the anterior fossa involving the cribiform plate and connecting the cerebral subarachnoid space with the ethmoid air cells and the outside world. It is probable that the massive pneumoventricle which later developed was produced by the entrance of air through the nose into the cerebral subarachnoid space and into the ventricles via the foramina of Luschka and

Magendie. It is also possible that the anterior pole of the lateral ventricle was nicked allowing a more direct entrance of air. As the fracture healed, the air was absorbed and finally disappeared. There appears to be little question, however, that both frontal lobes have been severely damaged.

It is more difficult to explain the sequence of events in the neurological picture. Immediately following the accident, the patient showed no abnormal neurological signs. Two months and eight days later on entering St. Elizabeths Hospital she showed a cerebellar gait, transient hemiparesis with facial weakness, rectal and vesical incontinence, but with normal temperature, pulse and respiration. These symptoms were all transitory and it is possible that part of them were functional and the rest the result of meningeal irritation.

The change in the psychiatric picture is perhaps most worthy of notice. Although many depressions have been temporarily cured by severe shock of a general nature, the quality of this patient's recovery hints at a more specific mechanism. The emotional flattening, mild euphoria and marked facetiousness of the organic frontal lobe picture is in striking contrast to the acuteness of the depression which she felt before the shooting. Her capacity to feel emotions acutely has been distinctly diminished by the destruction of the frontal lobes. This is indicated graphically by the absence of depression or any suicidal ideas for three years since the shooting and her lack of concern about her painful arthritis which has increased in severity. The absence of any intellectual defect is in accord with most work recently done on the frontal lobes. The findings of the Kent-Rosanoff and Rorschach tests showing childish associations with a tendency toward extroversion can be paralleled by post-operative studies in the lobotomy patients studied by Freeman and Watts with the assistance of Dr. Thelma Hunt.(8) Her alcoholism has continued unabated, and this, too, is in keeping with the notable failure of lobotomy to cure this condition. Following her convulsive attack of April, 1939, the patient became so frightened that her alcoholic intake decreased considerably, but this improvement is of too recent date to be seriously considered.

Summary

A 49-year-old female suffering from a depression complicated by alcoholism had made several unsuccessful suicidal attempts. In 1937 she became acutely depressed and shot a .25 caliber bullet through both frontal lobes. The bullet is still lodged in the left supraorbital region, the patient having a rhinorrhea and pneumoventricle for several months. Neurological findings were uncertain and transitory, with the exception of a series of severe convulsions which occurred two years after the shooting. The patient's alcoholism has persisted but her depression, which cleared up directly after the shooting has remained absent for over three years. Psychological tests indicate childishness, facetiousness and extroversion with no evidence of any organic change in her intellectual status.

APPENDIX I

KENT-ROSANOFF WORD ASSOCIATION TEST

12/2/39. Time: 9 Minutes

	Word	Association
1.	TABLE	chair
2.	DARK	light
3.	MUSIC	songs
4.	SICKNESS	health
5.	MAN	women
6.	DEEP	high
7.	SOFT	hard
8.	EATING	digestion
9.	MOUNTAIN	lake
10.	HOUSE	garage (laughs)
11.	BLACK	white
12.	MUTTON	lamb
13.	COMFORT	bed (laughs)
14.	HAND	feet
15.	SHORT	told
16.	FRUIT	juice
17.	BUTTERFLY	birds
18.	SMOOTH	hard
19.	COMMAND	obey
20.	CHAIR	table
21.	SWEET	sour
22.	WHISTLE	sing
23.	WOMAN	man
24.	COLD	hot
25.	SLOW	fast
26.	WISH	ah—well (thinking)
27.	RIVER	lake
28.	WHITE	black
29.	BEAUTIFUL	ugly
30.	WINDOW	door
31.	ROUGH	smooth
32.	CITIZEN	American
33.	FOOT	leg
34.	SPIDER	web
35.	NEEDLE	pin
36.	RED	purple
37.	SLEEP	awake
38.	ANGER	good humor
39.	CARPET	rug
40.	GIRL	boy
41.	HIGH	low
42.	WORKING	restin'
43.	SOUR	sweet
44.	EARTH	heaven
45.	TROUBLE	pleasure
46.	SOLDIER	men
47.	CABBAGE	Brussels sprouts (laughs)
48.	HARD	soft
49.	EAGLE	bird
50.	STOMACH	back
51.	STEM	flower

APPENDIX I—Continued

	Word	Association
52.	LAMP	table
53.	DREAM	nightmares—that's what I have
54.	YELLOW	Oh, green
55.	BREAD	butter
56.	JUSTICE	injustice
57.	BOY	gal (laughs)
58.	LIGHT	darkness
59.	HEALTH	ah, health—condition
60.	BIBLE	Prayer book
61.	MEMORY	mind
62.	SHEEP	lamb
63.	BATH	towels
64.	COTTAGE	house
65.	SWIFT	fast
66.	BLUE	emerald
67.	HUNGRY	starved
68.	PRIEST	monk
69.	OCEAN	sea
70.	HEAD	brain—if you've got any (laughs)
71.	STOVE	heat
72.	LONG	short
73.	RELIGION	none (laughs)
74.	WHISKEY	Scotch
75.	CHILD	baby
76.	BITTER	sweet
77.	HAMMER	nail
78.	THIRSTY	water
79.	CITY	town
80.	SQUARE	round
81.	BUTTER	bread
82.	DOCTOR	nurses—that's what I have mostly
83.	LOUD	talk
84.	THIEF	robber
85.	LION	Oh-h, wolf
86.	JOY	Pleasure
87.	BED	lounge
88.	HEAVY	fat
89.	TOBACCO	cigarette
90.	BABY	infant (laughs) "Same thing!"
81.	MOON	sun
92.	SCISSORS	knife
93.	QUIET	sleep
94.	GREEN	yellow
95.	SALT	sugar
96.	STREET	avenue
97.	KING	queen
98.	CHEESE	crackers
99.	BLOSSOM	flowers
100.	AFRAID	coward

APPENDIX II

Rorschach Test (One Eye Enucleated) 11/2/39

I.	1. WF —	Like a map. (Anything else?)
	2. WF + A	Looks kinda like a bat.
II.		Funny looking!
	3. DF + A	Kinda looks like a bear—two bears.
	4. DCF —	Those red things don't look like anything much except two splotches of ink. How's that?
III.	5. DF —	This thing looks like a bowl.
	6. DF —Hd	Looks like a leg and a shoe.
	7. DF — A	Kind of an animal—a rat. I think this is dumb if you awsk me! (Laughs heartily.)
IV.	8. WcF +	Good Lord, they get worse and worse! Like one of those fur rugs they stick on the floors. (Looks on back of card. Meaning of the words in small type is explained to her.) "Yeah—it don't tell anything. (Laughs.)
V.		Do we have to go through all those? (Points to remaining cards.)
	9. WF — A	Something like an eagle . . . . don't look much like anything if you ask me.
VI.		Let's not go into any more pictures. They're all so dumb looking.
	10. WcF +	Looks like another rug, I guess.
VII.	11. WKF —	Kinda like clouds. More like clouds if they had that middle thing out. (Puts finger on it.)
VIII.	12. DF + A	Hmm. Some colors—These two things look like an animal—fox.
	13. DKF —	These things (center) look like clouds. Don't look very much like it, but a little bit. (Laughs.)
IX.	14. WF —	Looks a bit like a map—but most all of them look like a map.
X.		Hmm—a lot of blotches.
	15. DF +A	Crab.
	16. DF — A	Lobster. The rest is just a mess. (Laughs uproariously.) Pretty colors, though. (In apologetic tone of voice as if to make amends for her previous disrespectful comment.)
	17. DF —	Wasp nest—these two.
	18. DF — A	Bugs—worms.

Summary—R equals 18

W	7	M 0	F +, 6	33%
D	11	C 1	F —, 12	66%
d	0	c 2	A	44%
	18	K 2		

$E_B = C > M$

KEY TO ABBREVIATIONS

Table I

(After Harrower-Erickson)

R	Total number of responses given to the series of ten ink blots.
W	Response to the blot as a whole.
D	Response to a large, obvious detail.
d	Small detail.
S	White space response.
M	Human movement.
FM	Animal movement.
m	Movement of inanimate objects.
K	Shading used as diffusion.
F	Form. Good form is F +; Poor form is F —.
c	Shading used as surface quality.

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THE SYNDROME OF INTERNAL FRONTAL HYPEROSTOSIS

Report of Eight Cases[1]

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For a little more than a decade increasing attention has been paid to a syndrome whose pathognomonic sign is internal frontal hyperostosis. Accompanying this bony abnormality are various concomitant manifestations, some more constant than others, of deranged metabolism, endocrine dysfunction and neuropsychiatric disorders. Morgagni (1) was the first to demonstrate, at the autopsy of a woman, the coincidence of internal frontal hyperostosis, obesity and virilism, the triad which now bears his name. In 1928 Stewart(2) drew attention to the association of frontal hyperostosis and marked obesity in the mentally ill, especially women. Shortly thereafter Morel(3) described the first living case, diagnosed radiographically, and the picture of internal frontal hyperostosis accompanied by adiposity and cerebral disturbances became known as the "Stewart-Morel syndrome."

Internal frontal hyperostosis is a common finding in women of advancing years, and according to Henschen(4, 5, 6), occurs in about 40 per cent of women after the menopause, if the lesser grades of the disorder are included. It is also found in younger patients, and an instance is here reported in a woman of 26, one of the youngest described in the literature. According to Moore(7), 98 per cent of the cases of this abnormal bone formation are to be found in women, and other investigators (Greig (8), Henschen(5, 6), Dressler(9)) have verified the marked preponderance of the female sex amongst those affected. A large majority of the patients exhibit obesity affecting particularly the face, neck and trunk, the extremities remaining comparatively slender. At times the history is obtained of rapid increase in weight relatively late in life. Facial hirsuties is a common finding.

Patients with internal frontal hyperostosis have frequently been observed to show neuropsychiatric disorders(10). Morel(3) first thought that lesions specific for this syndrome could be found in the walls of the third ventricle, but subsequently(11) retracted this view. Henschen(6), Reider (10n) and Ritter(12) were also unable to find characteristic lesions in this site. Of interest in view of the obesity so characteristic of this syndrome, is the opinion expressed by Ranson, Fisher and Ingram(13), derived from experimental work on monkeys, that there is no nucleus in the hypothalamus whose complete integrity is essential for proper regulation of fat metabolism. Various authors have attached different degrees of importance to the effect of the hyperostosis on the underlying brain tissue. Thus Delmas-Marsalet(10t) attributed the mental symptoms and the disorder of equilibrium shown by his patient to frontal lobe lesions produced by the hyperostosis. Greig(8), however, stated that intracranial osteophytes are harmless and symptomless and have no relation to insanity. Henschen(6) quotes Morel as subsequently falling into accord with the views of Greig, and also quotes Hellmer as stating that frontal hyperostosis produces no clinical symptoms. According to Henschen's experience also, Morgagni's syndrome can exist without mental or neurologic disorders. Schneider(14) is also of the opinion that internal frontal hyperostosis is not responsible for the production of signs and symptoms by pressure on the underlying brain tissue.

Bartelheimer(15) reported the case of a woman of 32 with Morgagni's syndrome, accompanied by hyperglycemia and glycosuria which were resistant to treatment with insulin. The insensitivity to insulin led him to believe that the diabetes was not due to pancreatic insufficiency, but rather to overfunction of the anterior lobe of the pituitary gland. Henschen(6) found diabetes mellitus in "not a few cases" of Morgagni's syn-

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drome, but "scarcely more frequently" than in his control material. Some of Carr's(10i) patients showed creatinuria which disappeared under therapy with amino-acetic acid; de Lehoczky and Orbán(10r) also noted creatinuria in their patient. Although various investigators have postulated the existence of a disturbance in calcium metabolism, there is no convincing evidence in the literature of such a disturbance. Vascular hypertension has been observed frequently; according to Pende(16), there is evidence in some cases of pituitary insufficiency, whereas in others there are signs of overfunction of the pituitary gland, and it is in the latter that hypertension is found.

Since Stewart(10b) first stated that "we are here dealing with a hitherto undifferentiated type of dyspituitarism," attention has been focused on the possible etiologic rôle of disorders of the hypophysis in producing the Morgagni syndrome. Henschen's(6) investigations of the cellular components of the anterior lobe of the hypophysis revealed an almost constant, and frequently very marked, increase in the number of eosinophile and basophile cells and a definite decrease in the number of chromophobe cells. However, he feels that no definitive evaluation of the etiologic significance of these cellular changes can as yet be made. He has demonstrated the analogies between Morgagni's syndrome and various other pituitary disorders, viz., the syndrome of hyperpituitarism in pregnancy, acromegaly, dystrophia adiposo-genitalis and Cushing's pituitary basophilism, and feels that the syndrome under discussion belongs in this general group. Ritter(12) investigated various types of obesity including Morgagni's syndrome, and found pituitary basophilism and lipoid hyperplasia of the adrenal cortices in all. He suggests that the changes in the hypophysis are not the cause of the obesity, but represent a compensatory process called forth by the disturbance in function of the endocrine glands participating in fat metabolism. Pende(16) found changes in the form and structure of the sella turcica in all cases of Morgagni's syndrome observed by him, and feels that disturbances in the hypophysis and in the region about the tuber infundibulum take part in the genesis of the hyperostosis or dysostosis of the skull. Bartelheimer(15), as pointed out above, attributed the hyperglycemia and glycosuria in his case of Morgagni's syndrome to overfunction of the anterior lobe of the pituitary gland. This contention is supported by the views of Long(17), who quotes the work from Houssay's laboratory demonstrating the glycosuric and hyperglycemic action of anterior pituitary extracts. Long also gives evidence to show that anterior pituitary extracts increase the resistance to insulin, and insulin insensitivity was observed by Bartelheimer in his case. Mortimer(18) was able to produce calvarial sclerosis and obesity in hypophysectomized animals by prolonged administration of crude alkaline anterior lobe extracts. He points out the significance of these findings as affording a possible explanation for the high frequency of the association of adiposity and cranial sclerosis in women, cases in which he mentions the occurrence of bony exostoses, especially on the inner aspect of the frontal bone. The sum total of the above findings points to the importance of pituitary dysfunction in the etiology of Morgagni's syndrome.

The hyperostosis is usually localized to the internal surface of the frontal bones, although it has also been observed less frequently in the temporal, parietal and occipital regions. The deposits on the frontal bones are usually bilaterally symmetrical and spare the sulcus for the superior longitudinal sinus. They consist of cancellous bone laid down on the internal table and covered by a thin layer of compact bone to which the dura mater is always adherent. The surface of the hyperostotic areas is usually grooved and ridged, resembling a relief map, although it may be comparatively smooth. The external surface of the skull shows no abnormalities, and the sutures and vessel channels are usually normal.

Various theories have been advanced to account for the formation of the hyperostoses and their localization in the frontal regions. Older writers(19) were of the opinion that the bone formation was due to cerebral congestion in mental patients subject to periodic excitement. Others(20) have considered this abnormal bone formation to be a senile change, or an effort on

the part of the organism to fill the room left vacant by senile atrophy of the brain. In addition to such senile atrophy, Dressler (9) considered as important contributory factors the maintenance of the supine position for long periods of time, and a general tendency of the female sex to undergo bone changes as a consequence of pregnancy. Morel(3) thought the traction of the dura mater on the affected regions of the skull to be the local factor operative in the formation of the hyperostoses. Greig(8) felt that "intracranial osteophytes are the outcome of disuse-absorption from the bony skeleton of calcium and phosphorus salts in excess of the existing excretory powers" and that "the formation of intracranial osteophytes is an innocuous relief to a system supersaturated with calcium brought about in an area which age renders least important, and which has the necessary blood supply for the nourishment of bone-forming cells." Moore(10h) has also elaborated on the theory of disturbed calcium (and fat) metabolism in this syndrome. Bertolotti and Nicotra(21) attribute the abnormal bone formation to a chronic calcifying and ossifying pachymeningitis set up by the spread of inflammation from a chronic infection of the sinuses into the skull by way of the lymph vessels. The multiplicity of the hypotheses mentioned above suggests dissatisfaction of various investigators with the explanations previously offered for the localization of the hyperostoses. The part played by the endocrine disturbance as the more remote cause of the hyperostosis has been well recognized.

Case Reports

The findings in eight cases of Morgagni's syndrome observed at Bellevue Psychiatric Hospital are summarized in Table I. All the patients were obese females, the obesity being distributed mainly in the face, neck and trunk with the exception of Case 3, where the limbs were also comparatively stout. Only two patients (3 and 5) showed no facial hirsutism. Hypertension was a common finding. At least four patients (Cases 1, 2, 7 and 8) showed a marked diminution or absence of sexual desire and had never had sexual relations; there were, however, no instances of genital dystrophy in the entire series. In all except Case 7 there were abnormal glucose tolerance curves, but only Case 1 showed glycosuria. Creatine was found in the urine in four cases in which this substance was sought for. Hypercalcemia was present in Case 1 only. Cases 1 and 2 had a moderate polymorphonuclear leucocytosis and increase in the number of red blood cells. The blood Wassermann test and spinal fluid Wassermann and colloidal gold tests were negative in all cases. There were no abnormalities in the protein and cell content of the spinal fluids with the exception of Case 8, where there was evidence of a virus infection of the nervous system with a lymphocytic pleocytosis and increased protein content of the spinal fluid.

Almqvist(10f) reported diminished sensitivity to atropine and adrenalin in his case, as measured by changes in pulse and blood pressure. Three patients of the above group (Cases 2, 3 and 6) were given subcutaneous injections of atropine and showed responses as marked as those of two normal controls.

Comment

In the above group of cases there was none in which the neuropsychiatric signs and symptoms could be attributed directly to the hyperostoses, and it is evident that patients with Morgagni's syndrome may show no clinical disorder of the nervous system. It appears probable, however, that such bony prominences can be the direct, exciting cause of neuropsychiatric disorders in some instances.

Abély and Delmond(10l) have expressed the opinion that it is possible to relegate to the syndrome of internal frontal hyperostosis certain cases of the disease described by Launois and Bensaude(22), l'adénolipomatose symétrique à prédominance cervicale. However, this disease is observed almost exclusively in males, whereas the Morgagni syndrome is limited chiefly to females. Case 6 of the above series had a pedunculated lipoma about one inch in diameter in the left inguinal region, and was the only one of the group to show such fatty tumor formation.

The creatinuria observed in cases of Morgagni's syndrome is further evidence of dys-

function of the anterior lobe of the pituitary gland. Shapiro and Zwarenstein(23) have shown that hypophysectomy in the South African toad, Xenopus laevis, leads to a slow loss of muscle creatine; they also demonstrated that removal of the whole pituitary has the same effect as removal of the anterior lobe alone, and that the posterior lobe plays no part in the control of muscle creatine(24). Pizzolato and Beard(25) showed that, in young rats, the injection of anterior pituitary extract containing the growth, thyrotropic and sex hormones, caused large increases in creatine excretion, which were more marked in the castrated than in the normal animal.

The factors operating in the determination of the localization of the hyperostoses have not been clear; the various hypotheses postulated have been mentioned above. It would appear that local, physical factors are significant. It is also of importance to note that, while skeletal abnormalities are common in endocrine disorders, the peculiar bone formation in Morgagni's syndrome is limited to the skull and changes in the rest of the skeleton are minor or absent. Cross section of the calvarium gives the impression that there has been a deposition of calcium salts on the endocranial surface of the internal table in the affected regions, with subsequent stimulation of activity of the neighboring osteoblasts, so that new bone is formed. The passage of large amounts of calcium salts into the cerebrospinal fluid and through the meninges would depend on

TABLE I

Case	Age	Height, inches	Weight, pounds	Chief psychiatric findings	Chief neurologic findings	X-ray findings	Blood pressure
1	41	65½	164	Psychosis with hypertensive encephalopathy (confusion, disorientation, memory defects, etc.) with recovery.	Myopia; degenerative retinopathy. Otherwise negative.	Marked I.F.H.* S.T.† normal. Optic foramina normal. Remainder of skeleton normal.	198/136
2	52	60½	147	Psychosis with hypertensive encephalopathy (irritability, emotional lability, memory defects, defective judgment, etc.).	Negative.	Marked I.F.H. S.T. normal.	226/136
3	78	58	105	Psychosis with cerebral arteriosclerosis (disorientation, memory defects, emotional instability, etc.).	Negative.	Extensive and marked I.F.H. S.T. normal.	212/105
4	76	..	...	Psychosis with cerebral arteriosclerosis and bromide intoxication (confusion, incoherence of speech, perseveration, memory defects, disorientation).	Negative.	Moderate I.F.H. S.T. normal. Calcified internal carotid arteries.	196/88
5	40	59	148	Psychosis with hypertensive encephalopathy (confusion, emotional lability, memory defects, disorientation).	Retinal hemorrhages with detachment of both retinae. Right hemiparesis with recovery. Spontaneous subarachnoid hemorrhage.	Marked I.F.H. S.T. normal.	188/126
6	63	60½	150	Epileptic deterioration (memory defects, disorientation, emotional and intellectual deterioration).	Idiopathic grand mal seizures since age of 18. Neurologic examination negative.	Marked I.F.H. S.T. normal.	140/90
7	26	60	166	Reactive depression (suicidal because of severe headaches).	Migraine of 6 years duration.	Moderate I.F.H. S.T. normal. Accessory nasal sinuses normal. Spina bifida of first sacral segment. Wrists and hands normal.	130/88
8	72	61	106	Psychosis (delirium) with infectious disease, with recovery.	Herpes zoster of ophthalmic division of trigeminal nerve. Marked myopia with degenerative retinopathy. Anosmia (after ethmoidectomy).	Marked I.F.H. S.T. normal.	140/78

* Internal frontal hyperostosis.
† Sella turcica.
‡ Figures for blood sugar are for fasting levels, and ½ hr., 1 hr. and 2 hrs. after ingestion of 50 gms. of glucose.

increased permeability of the hemato-encephalic barrier and of the meninges. The hyperostoses are most common in those regions where the curvature of the skull bones is greatest—situations in which the flow of the cerebrospinal fluid is likely to be slowest, and where there would be increased opportunity for sedimentation to occur. In cases of Morgagni's syndrome accompanied by hypertension and arteriosclerosis it may be assumed that there is increased permeability of the blood-brain barrier, but another cause must be sought for this in those cases in which there are no changes in the circulatory apparatus. In such instances endocrine factors appear to be responsible for the increased permeability. Carrying out their investigations on dogs, Heilig and Hoff(26) found an increased barrier permeability to uranin when the animals were given both thyroid and ovarian products by mouth for some time, and the same drugs were then injected at the time of the administration of uranin. Katzenelbogen(27) quotes Heilig and Hoff, and Benda as having shown that the permeability of the barrier between blood and cerebrospinal fluid is increased during the premenstrual period and the flow, although it must be pointed out that there is conflicting evidence on this point. In this connection it is interesting to refer to Benda's(28) work, showing that an increase of barrier permeability sometimes occurs during pregnancy. This is probably of significance in the formation of "puerperal osteophytes" of the skull during pregnancy, and lends support to the hypothesis here advanced for the formation of the hyperostoses of Morgagni's syndrome. The evidence for the relationship of barrier permeability to menstruation and ovarian function suggests at least a partial explanation for

TABLE I—CONTINUED

Basal metab. rate %	Serum calcium mg.%	Serum phosphorus mg.%	Blood cholesterol mg.%	Blood creatinine mg.%	Glucose tolerance test ‡	Urine	Other findings
0	13.7 10.2 12.2	3.9 5.3 4.3	150 240 ...	.. .. ..	192, 258, 314, 310	Glycosuria.	Amenorrhoea since age of 18. Uterine fibromyomata; no adrenal or ovarian tumor found at laparotomy. Exophthalmos. Hirsuties of chin and upper lip.
+ 7	11.6	3.9	162	1.5	141, 250, 286, 140	Creatine 6 mg.%	Retinal arteriolar sclerosis. Hirsuties of chin, cheeks and upper lip.
+50 +37	9.7	5.0	142	1.7	128, 232, 263, 140	Albuminuria, R.B.C. and W.B.C. present. Creatine 3 mg.%	Retinal arteriolar sclerosis. No abnormal hirsutism. Evidence of weight loss.
..	8.9	3.9	163	..	93, 133, 195, 120	Creatine 5.5 mg.%	Marked hirsutism of chin and upper lip. Serum bromides 225 mg.%
..	10.0	3.8	163	1.5	121, 167, 220, 204	Creatine 34.5 mg.% Occasional R.B.C. and W.B.C.	No facial hirsutism.
+ 7	11.0	2.6	...	1.9	117, 193, 236, 167	Negative.	Hirsuties of upper lip and chin. Axillary hair had dropped out completely. Pubic hair scant.
−14 −19	10.4 ...	.. ..	181 ...	1.8 ..	106, 181, 175, 120	Negative.	Gain of 36 lbs. in weight in 6 months. Hirsuties of chest, extremities and face (cheeks and upper lip).
.. ..	11.4 9.4	3.5 3.0	163 ...	.. ..	108, 181, 222, 210	Negative.	Hirsuties of chin and upper lip. Axillary hair had dropped out completely. Pubic hair scant.

the preponderance of the incidence of Morgagni's syndrome in females.

Summary

There is a syndrome occurring almost exclusively in females, whose pathognomonic sign is internal frontal hyperostosis, and which is generally accompanied by truncal obesity and frequently by facial hirsutism. Certain other metabolic and physiologic disturbances are more or less commonly observed. Considerable experimental, morphologic and pathophysiologic evidence now exists to point to the etiologic importance in this disease of dysfunction of the anterior lobe of the pituitary gland. Neurologic and mental sequelae, as a consequence of the presence of the hyperostoses, appear to be quite infrequent. In the series of cases here presented it was felt that the neuropsychiatric signs and symptoms were not to be attributed to the effect of the hyperostoses on the underlying brain tissue, but were the result of other factors, such as cerebral arteriosclerosis, hypertension, etc. A theory to account for the formation and localization of the hyperostoses has been advanced.

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HISTOPATHOLOGICAL CHANGES IN EXPERIMENTAL METRAZOL CONVULSIONS IN MONKEYS[1]

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The increasing favor which the Sakel and von Meduna methods have met in the treatment of schizophrenia, has led many investigators to study the histopathological changes, especially within the central nervous system, resulting from these types of shock therapy.

Whereas definite data are already available on the changes following insulin shock therapy, far more uncertain and contradictory are the data on the consequences of metrazol convulsions. This consideration justified, in my opinion, further study of the histopathological findings following experimental metrazol convulsions in monkeys.

In the experimental field, von Meduna(1) studied the histological effects of convulsions induced by camphor in guinea pigs. He injected subcutaneously different doses of 25 per cent camphor solutions. He found that the nerve cells were diffusely diseased, showing dislocation of nuclei, formation of vacuoles and fissures. In the medulla oblongata and in the cerebellum the lesions were more severe. The author felt that all these lesions were independent of blood vessel changes.

Stender(2) used rabbits and cats. He started by injecting 0.04 gm. cardiazol per kg. weight of the animal and increased gradually the doses to 0.1. per kg In young subjects he found nerve cell alterations, especially of the ischemic type, in the cerebral cortex and in the Ammon's horn, particularly. Subpial hemorrhages were interpreted as of traumatic origin, occurring during the convulsions.

Kastein(3) produced in rabbits 1 to 15 seizures with different doses of cardiazol. He found nerve cell alterations especially in the nucleus habenulae and in the Purkinje cells. These consisted of tygrolysis, vacuolation, pyknosis, swelling and displacement of the nucleus to the periphery. Some cells presented severe degenerative changes of the Nissl type. Shrinkage of nerve cells was present, diffusely distributed. The author did not observe appreciable vascular involvement.

Reitman(4) carried out experiments on two dogs. The first, weighing 8 kg. received a total of 38.3 cc. of cardiazol within 9 days and the second, weighing 12 kg., received 68.5 cc. within 12 days. The first dog showed only slight histopathological damages. The other presented many cortical, subarachnoidal and even ventricular hemorrhages. The vessels in the center of the hemorrhages disclosed, however, no structural changes. Diseased ganglion cells were found diffusely distributed; they showed vacuolation, disintegration of Nissl bodies and incrustation.

De Morsier, Georgi and Rutischauser(5) used two rabbits. One was injected intravenously 9 times in one month with a total of 4.50 cc. of cardiazol; the other was given a unique massive dose. No histologic alterations were found in either animal; only a generalized hyperemia, similar to that which occurs in death from asphyxia, could be seen in the second rabbit.

Strecker, Alpers, Flaherty and Hughes(6) used monkeys. Seven animals, weighing between 2 and 6 kgs. were given intra-arterial injections of a 10 per cent solution of metrazol in amounts varying from 5 to 30 mg. Three animals showed no evidence of damage to the brain. In one animal the cells of the external layer of the upper portion of the lamina pyramidalis in the frontal and parietal cortex showed swelling and vacuolization of the cytoplasm. Thin and scattered subarachnoidal hemorrhages were found in the remaining three animals.

Mijashita(7) submitted rabbits to injections of from 0.4 to 1.8 cc. of 10 per cent cardiazol. In some cases seizures were induced as high as 55 times. The author did not find hemorrhages or softening. He observed changes of acute and subacute degeneration of nerve cells all over the cortex.

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Liebert and Weil(8) obtained different results in seven rabbits. Definite histopathological changes were observed only after injections of a total of more than 700 mg. of metrazol. Shrinkage of both cytoplasm and nuclei of neurons and hyperplasia and hypertrophy of different types of glia cells were reported. The striatum and hippocampus showed the more pronounced pathological changes.

With microincineration methods, Liebert and Heilbrunn(9) found dust formation, hypomineralization, vacuolization or complete demineralization of the ganglion cells, prominently in the Ammon's horn.

Whitehead, Neubürger, Rutledge and Silcott(10) used 3 dogs and 4 rabbits. The drug was given 3 times a week for a total of 14 to 18 injections. For the dogs the dosage varied from 10 to 35 mg. per kg.; for the rabbits it varied from 10 to 30 mg. per kg. The authors did not limit themselves to the study of the nervous system, but examined also the visceral organs. Tubular degeneration in the kidney, scattered hemorrhages in the lungs, increased amount of hemosiderin in the spleen and generalized visceral congestion were found. However, the most important lesions were noted in the cerebral cortex, consisting of more or less complete necrosis of the nervous parenchyma in small circumscribed areas.

Cleckley, Bowles and Mittler(11) injected subcutaneously 10 mice. The dosages varied from a total amount of 0.4 mg. to 4.0 mg. The authors found remarkable lesions involving especially the blood vessels—hyalin degeneration, thrombi and hemorrhages. They also observed some loss in the number of neurocytes throughout the brain and chromatolysis of other cells.

Winkelman and Moore(12) treated cats with a varying number of convulsions, the average dose of metrazol varying in the different animals from 0.8 cc. to 2.0 cc. Pyknosis of scattered cells of a minimal degree was reported.

Rotter and Krug(13) found in guinea pigs which presented status epilepticus after a number of injections of cardiazol, subacute degenerative changes of the Nissl type in the nerve cells. They did not find pathological changes in rabbits which were given convulsive doses of cardiazol, not proportional to the weight of the animal used.

Pinto Pupo(14) found alterations of different but always minimal intensity in rabbits injected with varying amounts of cardiazol. Regions of paleness, ischemia and shrinkage of nerve cells were observed. In the Ammon's horn rod cells in excess were also seen. In animals that died or were killed during convulsions, acute degenerative and edematous changes of nerve cells, dilatation of blood vessels and "edematous lacunar spaces" were seen.

Besides the experimental reports there are also a few reports on human material. Hayman and Body(15) reported a case of death following metrazol treatment in the course of which 6 injections of a 10 per cent solution with a total of 27 cc. of fluid were injected. No pathological lesions were found in the nervous system.

In a woman who died after metrazol treatment, consisting of 2 injections of 4 and 5 cc. respectively of a 10 per cent solution, Hassin(16) observed swelling of the ganglion cells, chromatolysis, occasional edema, liquefaction and neuronophagia. The author pointed out that the histological changes may have been influenced by a previous insulin treatment.

Weil and Liebert(17) studied the brains of 6 patients with dementia præcox, manic-depressive psychosis and involutional melancholia, who died of pulmonary tuberculosis or bronchopneumonia 2 to 10 months after treatment with metrazol. Hypertrophy and hyperplasia of astrocytes and, to a lesser degree, of the microglia were observed. Negative control examinations upon psychotic and non-psychotic patients authorize the authors to exclude the tuberculous process as a cause of these alterations.

Summarizing the reports of the literature, one can divide into four groups the reports of histopathological findings in the nervous system following metrazol treatment.

1. The group in which histopathological findings are absent.

2. The group in which nerve cells are variously and diffusely involved.

3. The group in which the glia and microglia are chiefly involved.

4. The group in which involvement of the vascular system is reported.

Material and Method

The material used in the present experimental work consisted of five monkeys. Genus, weight, number of injections, convulsions and duration of the experiment are indicated in Table I. A solution of 10 per cent metrazol was administered by intravenous injections. The doses, their gradual increase and the clinical course of the treatment, are described in the protocols of each animal. The monkeys died spontaneously in the course of final protracted convulsions, except monkey 4 which was decapitated at the climax of the tonic period of the 49th convulsion.

TABLE I

Monkey	Genus	Weight	Duration of experiment (days)	Injections	Convulsions	Total amount of 10 per cent metrazol injected	Average dose by kg.
1	Cebus	2000	33	24	16	cc. 22	cc. 0.46
2	Cebus	1970	26	20	17	cc. 14.74	cc. 0.37
3	Cebus	2000	13	11	11	cc. 14.30	cc. 0.65
4	Macacus	3325	82	53	49	cc. 55.50	cc. 0.31
5	Macacus	3530	71	47	45	cc. 38.50	cc. 0.23

The usual methods of neuropathology were used for histologic examination of the nervous system (Nissl, Spielmeyer, Holzer, Sudan III, Cajal, Hortega, etc.). Mallory, hematoxylin and eosin, Sudan III were used for the viscera. In addition, Pickworth's benzidine stain was used in monkeys 4 and 5 to examine the cerebral vascular pattern.

Summary of the Protocols

Monkey No. 1.—The animal received 24 intravenous injections of 10 per cent metrazol solution. With increasing tolerance to the drug, the dose was increased from 0.05 to 0.10 cc. each time. However, with 24 injections, only 16 convulsions were elicited. The initial dose was 0.25 cc.; the last one 1.80 cc. The convulsions usually ranged from 1 to 10 minutes in duration and were followed by a stuporous state which the first few times lasted about 30 minutes but later was reduced to only 10 to 15 minutes.

Following the last injection status epilepticus set in; complete epileptic convulsions succeeded each other at brief intervals. Clonic movements of one or more limbs, screaming, dyspnea, salivation were present between one complete seizure and another. The animal died in persistent status epilepticus two hours after the injection.

Autopsy.—No gross alterations were found.

Histological Examination: Nervous System.—The meninges present no appreciable changes. The cortical cytoarchitecture is well preserved throughout the brain. Only in the cortex of the insula a slight dropping out of ganglion cells is noted.

In the frontal lobes numerous small groups of cells showing severe degenerative changes (Fig. 1a), namely palely stained cytoplasm, partial disintegration of Nissl bodies and occasional formation of vacuoles, are noticeable. Other nerve cells present acute swelling, the cellular body being increased in volume, the nucleus displaced to the periphery and the dendrites somewhat tortuous. In addition, particularly in the layer of the pyramidal cells, some of the elements show uneven staining, the basal region being much more deeply stained. Slight progressive changes of the glia cells are encountered (Fig. 2), increase in satellitosis is evident and neuronophagia is also often encountered, the degenerated nerve cells being phagocytosed by glial cells, encroaching on the neuron from all sides (Fig. 3).

The other cortical regions (parietal, temporal and occipital) disclose the same diffuse distribution of lesions but in a far lesser amount. In addition, nerve cell changes of the ischemic type are present here and there in the parietal lobe (Fig. 1b).

In the nucleus anterior thalami, in the caudate nucleus and particularly in the Ammon's horn, edematous nerve cells of characteristic aspect are encountered; they are often swollen, with a deeply stained nucleus which is separated by a pale ring-like area from the outer part of the cytoplasm (Fig. 4). In the basal ganglia acute swelling of oligodendroglia is also encountered.

The white matter appears normal and sections stained with the Spielmeyer method fail to show any demyelination through the entire brain. Especially in the white matter of the frontal lobes, nuclei of glia cells are gathered in compact rows along the blood vessels, pointing to a possible increase of oligodendroglia cells.

In the cerebellum swelling of Purkinje cells and their occasional disappearance, especially at the bottom of the gyri is to be reported.

Holzer-stained sections show fibrillar gliosis around the fourth ventricle, slightly in excess of what one may find in normal material.

In the pons and in the medulla oblongata many cells disclose acute swelling. Small groups of palely stained cells with shadow appearance are here, too, recognizable.

No fat is detectable with Sudan III.

Viscera.—The kidneys show an outstanding picture of interstitial and parenchymatous nephritis. The majority of glomeruli are increased in volume. Some are swollen, others have lost their circular shape. Many glomeruli show excessive cellularity due to the presence of many endothelial and mononuclear cells. A few glomeruli are shrunken; their subcapsular space is partially occupied by a crescent of epithelial cells. Bowman capsule of many other glomeruli appears homogeneously enlarged. The more striking picture is to be found in the inter-

stitial tissues where imposing infiltrations of fibroblasts and mononuclear cells are seen, especially in the vicinity of blood vessels. The tubules present cloudy swelling of their lining cells.

In the liver, a dark brownish pigment is scattered throughout the entire organ in intracellular and extracellular position, constituting a characteristic finding. It does not seem to be in the nucleus itself. In some cells as many as three or four round dots of pigments are detectable. Prussian blue and Gmelin reaction fail to stain this pigment.

The spleen shows enlargement of lymphoid follicles and presence of the same pigment as described in the liver scatteringly distributed and in small amount.

MONKEY No. 2.—The animal received 20 injections, 17 of which were followed by seizures. The initial dose was 0.30 cc. and the last one 1.80 cc. The complete seizures lasted from 1 to 10 minutes and were followed by a brief stuporous state. The last injection brought about status epilepticus during which the animal died after an hour.

Histological Examination.—The leptomeninges show here and there little infiltrations of round cells, mostly lymphocytes. Diffuse involvement of nerve cells is not found in any of the examined regions of the brain. Only here and there some of the ganglion cells appear hyperchromatic *in toto* or irregularly colored, with dendrites deeply stained, assuming a characteristic corkscrew appearance. Several shadow cells are seen, generally gathered in small circumscribed groups. Glia structures disclose no appreciable reaction. White substance and basal ganglia appear free from appreciable pathological involvement.

Viscera.—The kidneys present a pathological reaction as described in the previous case, though less pronounced. A few glomeruli are stricken, the reaction being particularly of the interstitial type. Collection of lymphocytes with a few plasma cells and fibroblasts constitute the bulk of the infiltration.

The same pigmentation, as reported in the previous case, is present in the liver.

MONKEY No. 3.—In this animal it was planned to study the effect of far larger doses of metrazol than those usually used therapeutically. The initial dose was 0.80 cc. and the last 1.80 cc. All the 11 injections provoked a status epilepticus of long duration. After the first seizure, others followed at intervals ranging from several seconds to a few minutes. Within 30 to 45 minutes the animal had about 10 to 15 complete attacks and several partial convulsions, localized either in the anterior or posterior limbs. A comatose state generally followed. After the last injection the status epilepticus was particularly severe. The seizures were frequent, with clonic spasms in the intervals. Later the seizures became less frequent. Three hours and forty minutes after the last injection, obitus occurred.

Histological Examination.—The meninges presented no appreciable macroscopic or microscopic changes. Numerous Nissl sections from the different regions of the brain fail to show definite pathology. Some rare swollen cells possibly related to the prolonged agonal period are observed. Some shadow cells are also seen, but not more than are found in normal specimens examined for control. Other staining methods do not disclose alteration of other nervous elements, or of the vascular system throughout the brain and cerebellum.

Viscera.—The kidneys present, however, the same picture as in No. 2, but with lesser intensity and diffusion. The same pigment, also in smaller amount, is seen in the liver.

MONKEY No. 4.—In this animal and in No. 5, it was intended to study the effect of a much prolonged series of convulsive seizures.

The animal received 53 injections, 49 of which were followed by convulsive seizures. The initial dose of 0.4 cc. was gradually increased, the last dose being 2 cc. The animal was killed by decapitation during the climax of the tonic period of the last convulsion.

Autopsy.—The surfaces of the brain appear totally anemic.

Histologic Examination.—Macroscopic examination is essentially negative. Histologically, however, in the cortex of the frontal lobe big areas of paleness are noticed with cellular stains. The cells appeared hypochromatic, a little swollen; the nucleus also swollen, displaced to the periphery and its limiting membrane poorly outlined.

In the cerebellum disappearance of some Purkinje cells is noticed. Glia cells and microglia elements appear generally normal.

Pickworth stain shows a generalized breaking up in many fragments of the blood columns of the cortical capillaries. In some regions the characteristic angioarchitecture of the cortex is completely altered (Fig. 5). One fails to encounter at regular intervals the bigger vessels directed perpendicularly toward the surface and from which the thinner ramifications depart, but a large number of little capillary fragments irregularly disseminated. I considered this appearance as expression of generalized spasm, not complete, however, so that remnants of the vessels are still visible.

Even the large blood vessels which often appear so clearly in contrast to the capillaries, undergo a partial spasm. Within the general background of partial spasm one notices small circumscribed areas of more complete anemia, with the disappearance even of the described fragments. No hemorrhages are seen.

No tubercular lesions were found anywhere in the brain or in the various organs, therefore the change in vascular pattern cannot be related to the infectious process.

Viscera.—The kidneys disclosed a slight nephritic process with no pigment found in the liver.

MONKEY No. 5.—This monkey received 47 injections, 45 of which were followed by convulsions. The doses were relatively small in relation to the weight of the animal (see table). The initial dose was 0.45 cc. and the last 2 cc.

The animal died after the 47th injection, during protracted convulsions.

Autopsy.—There were numerous Tb. nodular lesions in the lungs and liver and enlargement of peritoneal lymph glands. The meninges were cloudy and adherent to the skull.

Histological Examination.—The meninges appear here and there thickened and show slight round cell infiltration. As in No. 3, sections for ganglion cells, myelin and glia do not disclose any appreciable histologic change in the brain except for some isolated occurrence of cellular acute swelling. On the other hand, very characteristic features appear in Pickworth benzidine stained sections. The external layers of the cortex show a remarkable anemia, especially in the insula and in the occipital lobes. Whereas the larger blood vessels, from which the ramifications of the capillaries take origin are dilated and filled with blood, the capillaries of the outer layer are in evident contraction (Fig. 6). The internal layers of the cortex which generally are hyperemic disclose here and there anemic spots.

The white matter also appears congested, the vascular bed of the larger vessels being dilated and full of blood. However, minor anemic foci are also present in it. No hemorrhages are seen.

Viscera.—In the liver the same pigment, previously described in other cases, is present in small amount. A picture similar to that of the previous cases is observed in the kidneys. Lesions of tubercular nature are also seen in the lungs and liver.

Comments

As in the investigations carried out by previous workers, the present experiments brought forward different changes in the different animals. Nerve cell alterations were found only in three cases, No. 1, No. 2 and No. 4 and in these, too, they were of varied intensity, since in No. 2, the alterations were hardly appreciable.

A striking observation was that in our cases the lesions were not in any way proportional to the duration and dosage of the experiment and to the severity of the seizures. Monkey No. 1 which had 16 convulsions and received an average dose of 0.46 cc. per kg. shows the more pronounced changes. Monkey No. 3 which was given extremely high doses of metrazol, which elicited status epilepticus lasting from 45 minutes to 1 hour following each injection, shows no appreciable lesions. Monkey No. 5 which had 45 seizures does not show any cellular changes, and monkey No. 4 which had 49 attacks shows lesions less severe than monkey No. 1.

Thus it appears from our material that the severity of the lesions is not proportional to the number of seizures, to the amount of drug injected nor to the duration of the convulsive state.

In the cases in which lesions are found they are relatively mild, and not comparable to those described following insulin treatment(18); no devastation of cortical architecture occurs, no remarkable dropping out of neurons, no proliferation of new blood vessels.

A slight discoloration of the insular region has been observed in case No. 1. The diseased cells in the cases where they were involved are generally gathered in small groups and present degenerative changes, some of them quite severe. In some cells the colliquation is complete and the appearance of the nerve cells undergoing the severe degeneration of the Nissl type is that of shadow elements. Other cells present swelling of the cytoplasm with displacement of the nucleus towards the periphery and paleness and homogeneous appearance of the cytoplasm. Edematous changes were seen in No. 1, especially in the region of the Ammon's horn. Chronic cell disease and ischemic changes occurred only here and there with no constancy of distribution and intensity. The nerve cell changes are generally associated with only a slight glial reaction of the progressive type.

Interesting observations have been made in monkeys No. 4 and 5 with sections stained by the Pickworth method. Almost complete anemia of the external layers of the cortex, marked spasm of cortical capillaries contrasting with the dilatation of the larger vessels and congestion of the white matter, were found in one case (monkey No. 5), whereas a general breaking down of the capillaries in many fragments, with minor foci of complete anemia, was observed in the other (monkey No. 4). These observations seem to confirm the same findings reported by Dresser and Scholz(19) and Whitehead and associates(10).

These two monkeys (4 and 5) had more than 45 seizures, a number far greater than usually administered to human subjects for therapeutic purposes. Presumably, all convulsive seizures were accompanied by similar vascular changes, and thus transient periods of inadequate vascularization, due either to the more or less complete vascular spasm or

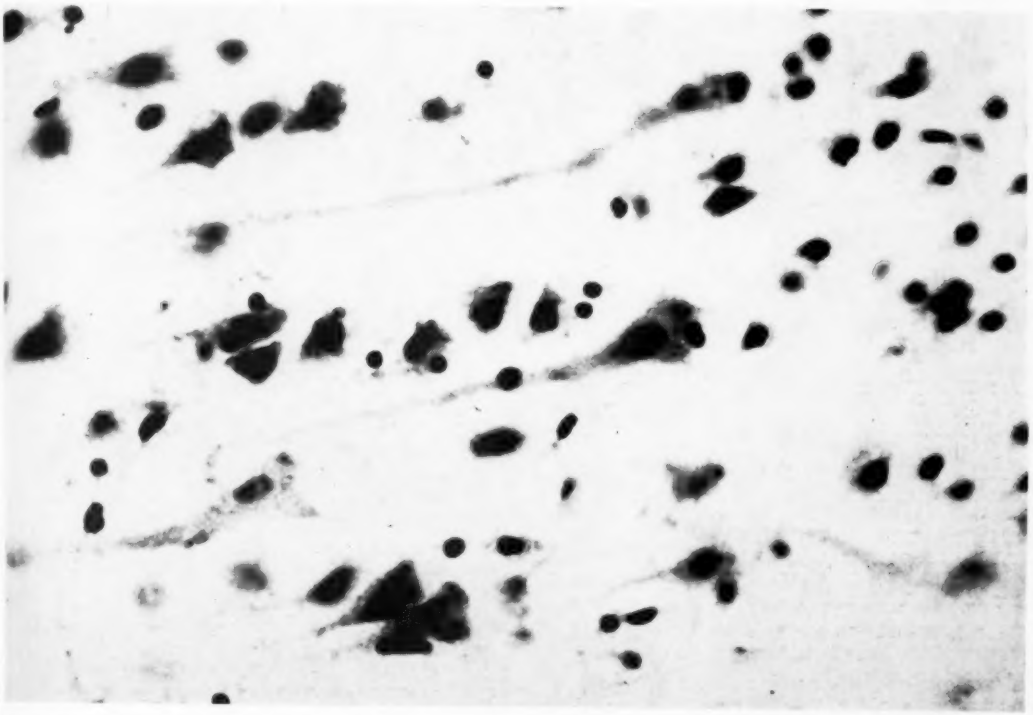

FIG. 1B.—Diseased ganglion cells showing ischemic changes.

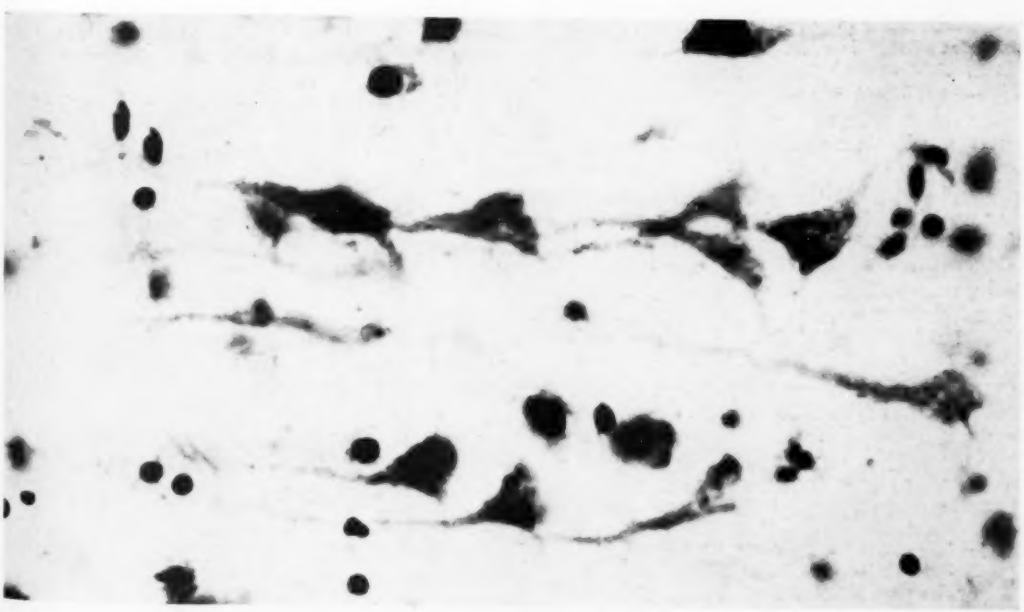

FIG. 1A.—Diseased ganglion cells showing severe degenerative changes.

Monkey No. 1. Nissl method. High magnification.

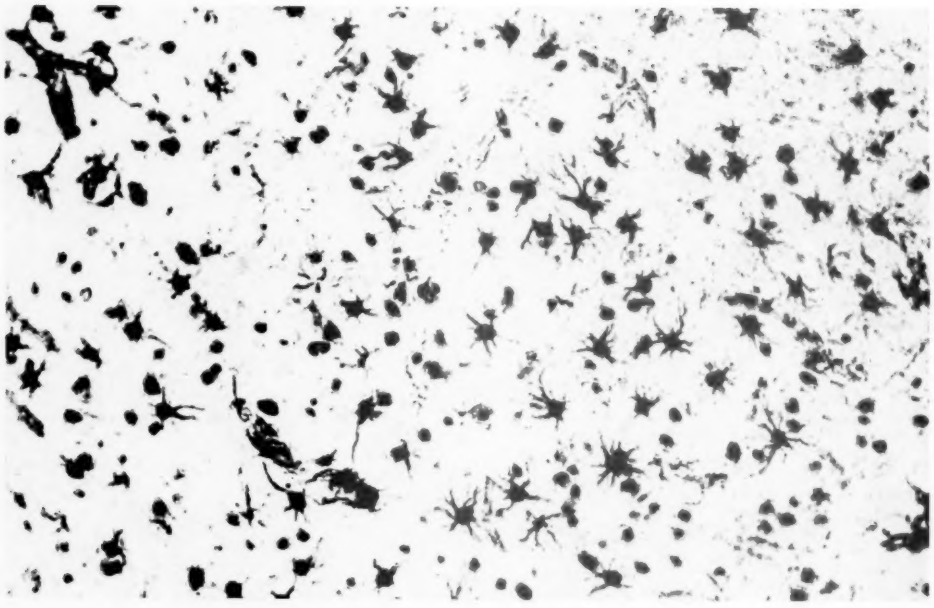

FIG. 2.—Moderate glia reaction of progressive type.
Monkey No. 1. Cajal method. Middle magnification.

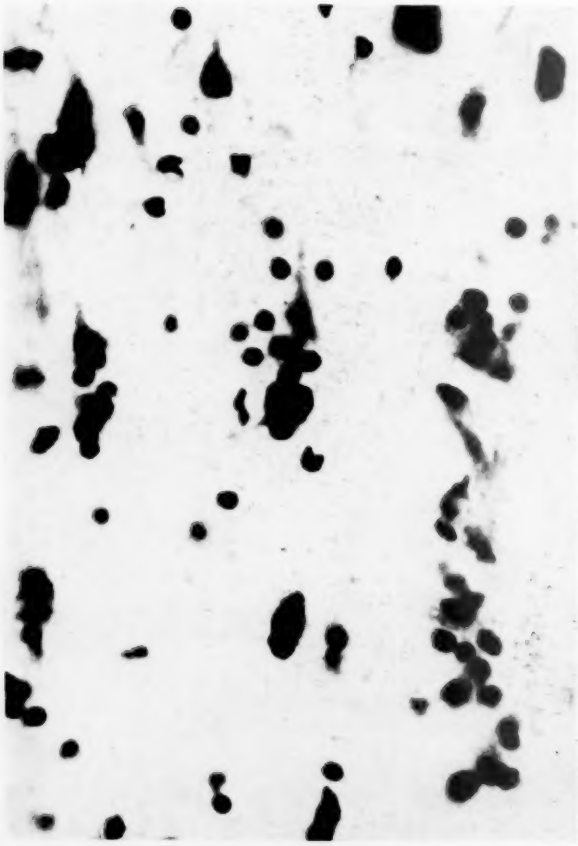

FIG. 3.—Increased satellitosis and neuronophagia.

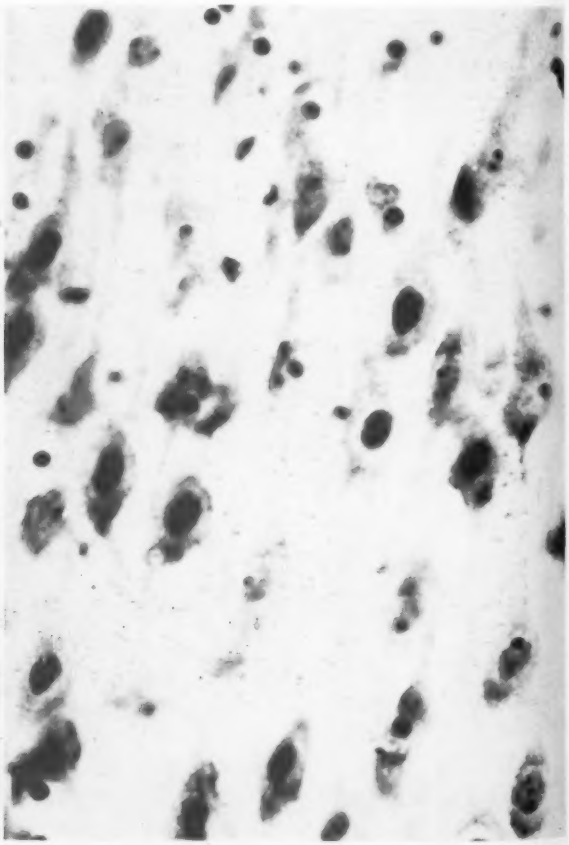

FIG. 4—Edematous changes of nerve cells.
Monkey No. 1. Nissl method. High magnification.

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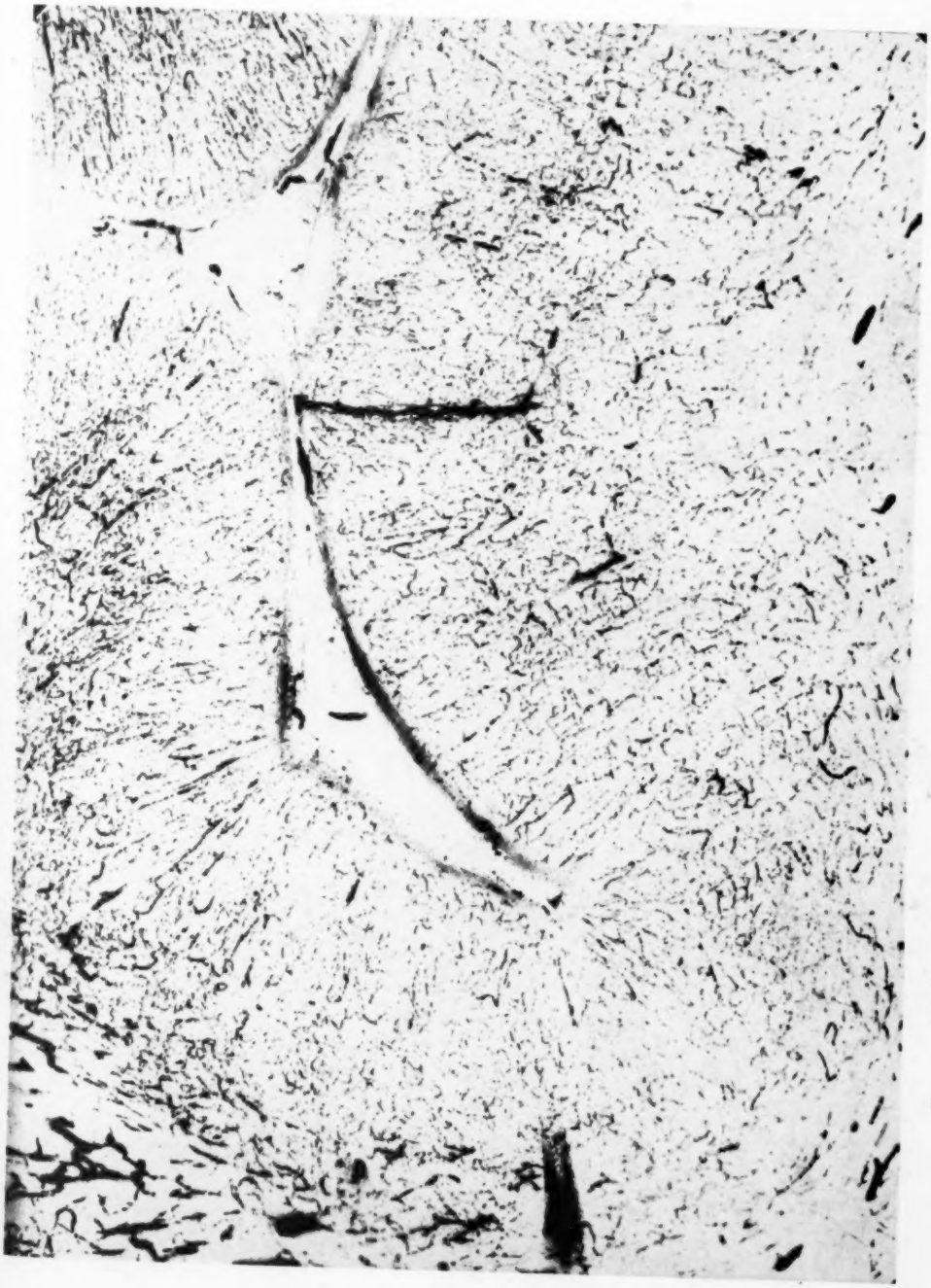

FIG. 5.—Modified appearance of cortical angioarchitecture as evidenced by Pickworth method. Monkey No. 4. Low magnification.

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FIG. 6.—Modified appearance of cortical angioarchitecture as evidenced by Pickworth method.
Monkey No. 5. Low magnification.

dilatation acted in a transitory manner over the nervous system. In spite of it, no appreciable (No. 5) or very little (No. 4) nerve cell alteration was found.

It seems, therefore, that these transitory functional vascular episodes cannot be held alone responsible for the cellular lesions. These blood vessel modifications which accompany the seizures may play an important part in the mechanism of the convulsive seizures but do not seem to be necessarily correlated with the nerve cell changes. When such changes are found one must speculate on the possibility that in addition to a vascular mechanism, a toxic factor might enter into action as the one determining the cellular changes.

Contrary to the results of some other authors, I did not find any hemorrhage in the central nervous system.

I was also surprised by the fact that in all cases a nephritis was found, affecting both the parenchyma and the interstitial tissue. Kidneys of normal control monkeys show only a moderate interstitial proliferation with some inflammatory cells. Though this point is not clear, it is possible to assume that some previous more or less latent inflammatory processes may have been reactivated and aggravated by metrazol treatment. They may be atypical manifestations of a tubercular process, so frequent in the monkey colonies of our laboratories, or of some unidentified zoo-pathological affection. If so, this factor might in turn render the correlation between metrazol treatment and nerve cell damages in the central nervous system a more complicated problem.

It seems advisable, in the light of this experimental work, that in addition to other tests, the function of the kidneys might also be examined before submitting patients to metrazol therapy.

Summary

In five monkeys, studied after a number of metrazol-induced convulsions it was observed that:

1. Histopathological changes in the central nervous system are not always present. When they occur they are not proportional to the number of convulsions, to the dosage of the drug or to the duration of the seizures.

2. The alterations, if found, are very mild, considerably milder than the ones described after insulin treatment. They consist of small groups of cells which present acute degenerative changes or at times the severe type of degeneration described by Nissl.

3. In two cases examined with the Pickworth method anemia of external cortical layers, anemic and hyperemic foci in the inner areas or generalized breaking up of the capillary blood columns network were observed.

4. These vascular modifications appear to be of functional character and do not seem to be responsible for the cellular lesions inasmuch as they are not generally accompanied by nerve cell changes.

5. Interstitial and parenchymatous nephritis was always found and the question of its possible relationship to some pre-existing pathological conditions aggravated by the metrazol, is raised.

6. A pigment, which gives no Prussian blue or Gmelin reaction was noted in the liver in 4 of the 5 cases examined.

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THE COMPARATIVE EFFECTS OF COMA DOSES OF AMORPHOUS INSULIN ADMINISTERED INTRAVENOUSLY AND SUBCUTANEOUSLY TO PSYCHOTIC PATIENTS[1]

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The object of this study was to ascertain whether, with the intravenous mode of administration, it is possible (1) to shorten the time of the individual treatment, (2) to reduce the amount of insulin required for the production of coma, (3) to facilitate arousal and thus avoid pulmonary complications. In order to secure comparative data the patients were given insulin, in stated intervals, both by the intravenous and the subcutaneous route. Thirteen patients with conditions classified as schizophrenia were studied; there were five males and eight females.

Procedure

In some cases the insulin was first administered intravenously, and in others subcutaneously. The usual initial dose was 20 units. This was increased by 20 to 40 units each day until coma was obtained. Then the dose was gradually diminished until coma was produced within a fairly constant time with what appeared to be a minimal dose. The patient was maintained on this dose for about 5 or 10 days, after which blood sugar studies were made. Then the mode of administration was changed from the subcutaneous to the intravenous route or vice versa. The dose was increased or decreased depending on whether coma was produced. The dose by this second mode of administration was stabilized and again blood sugar studies were made. Occasionally the method of injection of insulin was varied from day to day or at intervals of several days after the blood sugar samples had been obtained. The samples were analyzed according to the Somogyi(1) modification of the Schaffer Hartman method(2). Samples were drawn immediately before the injection of insulin and then usually every 20 minutes during the first hour and every 30 minutes thereafter until the patient went into coma. Two specimens were drawn during coma, one 15 minutes after the onset and the other immediately before the patient was fed.

On a few occasions these time intervals could not be adhered to exactly, so each series was plotted on a graph and the reading for the appropriate time was interpolated from this curve.

Definition of Coma

The patient's name was called loudly 3 times and if there was no verbal or facial response he was pricked 3 times around the upper lip and nostrils. Failure to respond by some facial grimace or other protective movement suggested the presence of coma. Coma was allowed to go on for one hour and was terminated by stomach tube or intravenously unless the patient emerged from it spontaneously.

A. Blood Sugar Responses to Intravenous and Subcutaneous Insulin

In all instances but one, the doses of insulin given intravenously and subcutaneously were the same for any one patient on the days when blood samples were drawn. In the one case the curve for intravenous insulin was obtained with 85 units and the curve for subcutaneous insulin with 190 units. In some cases the blood sugar values with intravenous insulin were determined by giving the same dose used for the subcutaneous

[1] Read at a meeting of the Illinois State Medical Society, Peoria, Ill., May 21, 1940.
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curve, although coma could have been produced with a smaller dose. This latter fact is of no particular significance in the rate of fall of the blood sugar, since we found remarkably comparable descending curves in patients in whom we constructed curves with high coma doses and then again with just adequate coma doses. Occasionally it did appear that with the higher dose the maximum fall was only a few milligrams greater.

By the intravenous route in the male subjects (Table I) the blood sugar fell from 79.4 to a minimum low figure of 23.2 mg. (max. fall of 56.2 mg.) in 40 minutes. In the female group the fall in blood sugar in 40 minutes was from 81.1 to 30.7 (50.4 mg.) but the lowest value of 26.7 mg. (max. fall of 54.4) was reached in 60 minutes.

Since the error in blood sugar determinations by this method may be ±5 mg., it is apparent that the maximum fall of 56.2 mg. in the male group is not significantly different from that of 54.4 mg. in the female group. It is true that in the latter group the maximum fall was not reached until 20 minutes later than in the former. However, one can attach little importance to the difference in the female patients between the fall of 50.4 mg. in 40 minutes and 54.4 mg. in 60 minutes. Norgaard and Thaysen(3) pointed out that in response to small doses of insulin given intravenously there was no difference in the rate of fall in normal male and female subjects, although the females had a wider variation in the restoration curve, with a more gradual return to normal levels. We were unable to determine restoration curves because our patients were fed after one hour of coma. There was no significant difference in the blood sugar values of the two groups 15 minutes after the onset of coma and just before the feeding was given. As is evident from Table I, the blood sugar values obtained after subcutaneous administration of coma doses of insulin are practically identical for male and female patients.

Table I also shows the average blood sugar values for all the patients together at the stated intervals. It is obvious that there is a much more abrupt fall in blood sugar when the insulin is given intravenously. Since a difference of ±5 mg. in our determinations is not significant, we may accept as the lowest value the first reading in blood sugar which is within the significantly low range. The significant fall, therefore, with intravenously administered insulin is from 80.5 to 27.8 (52.7) mg. and is reached in 40

TABLE I

AVERAGE BLOOD SUGAR STUDIES WITH AMORPHOUS INSULIN

	Fasting	20 mins.	40 mins.	60 mins.	1 hr. 30 mins.	2 hrs.	2 hrs. 30 mins.	3 hrs.	3 hrs. 30 mins.	4 hrs.	15 mins. after coma	Just before feeding
Average blood sugar:												
Intravenous:												
Male	79.4	44.8	23.2	26.5	29.2	28.9	30.3	...	...	...	29.7	37.4
Female	81.1	52.5	30.7	26.7	29.4	33.4	33.4	31.2	...	...	34.3	32.7
Both	80.5	49.5	*27.8*	26.6	29.3	31.7	31.3	...	...	...	32.4	34.9
Subcutaneous:												
Male	77.7	66.6	52.5	34.3	30.1	32.0	32.9	32.9	33.8	...	30.3	35.3
Female	82.7	71.9	56.2	44.2	35.6	33.8	34.6	35.4	38.0	39.0	34.8	34.1
Both	80.8	69.9	54.7	40.4	*33.5*	33.1	33.9	34.6	37.3	...	32.9	34.7
Average fall in blood sugar:												
Intravenous:												
Male	79.4	34.6	56.2	52.9	50.2	50.5	49.1	...	...	...	49.7	42.0
Female	81.1	28.6	50.4	54.4	51.7	47.7	47.7	49.9	...	...	46.8	48.4
Both	80.5	31.0	*52.7*	53.9	51.2	48.8	49.2	...	...	...	48.1	45.6
Subcutaneous:												
Male	77.7	11.1	25.2	43.4	47.6	45.7	44.6	44.6	...	...	47.4	42.4
Female	82.7	10.6	26.5	38.5	47.1	48.9	48.1	47.3	44.7	43.7	47.9	48.6
Both	80.8	10.9	26.1	40.4	*47.3*	47.7	46.9	46.2	43.5	...	47.9	46.1

minutes, whereas with subcutaneous administration the significant maximal fall in blood sugar from 80.8 to 33.5 (47.3) mg. is not reached until 90 min. after injection. In other words, if the insulin is given intravenously the fall not only is more abrupt but is also somewhat greater. After two hours the blood sugar levels are about the same for both methods. This is also true of the values during the period of coma.

The literature is replete with studies pointing out this difference in action of small doses of insulin administered intravenously and subcutaneously to man and animals, yet there are recent studies which create confusion because of failure to recognize this clearly. We have been unable to find any studies in man in which coma doses of insulin have been given intravenously.[2]

It has been generally accepted by all investigators that there is a more prompt blood sugar response to a small dose of insulin when it is administered intravenously than when it is given subcutaneously. This fact was demonstrated in 1923 by Bodansky(4), working with sheep, and by McCormick, Macleod, Noble and O'Brien(5), working with rabbits. The latter workers stated that there was no striking difference in the response to the two methods of administration except that both the fall in blood sugar during the first ½ hour and the subsequent recovery may be somewhat more rapid following intravenous injection. In rabbits the difference in the blood sugar response was less marked than that found in man by other investigators. Their work has been erroneously quoted as establishing no difference in the response of the blood sugar to the two modes of administration(6, 7). Other workers, for example, Lyman, Nichols and McCann in 1923(8), Raab in 1924(9), Bodansky and Simpson in 1927(10), Csépai and Ernst in 1928(11), Norgaard and Thaysen in 1929(4), Labbé, Escalier and Uhry in 1934(12), and Meythaler and Kleineidam in 1935(13) made similar studies on the intravenous injection of from 2 to 20 units of insulin in normal man. The consensus of opinion is that the maximum blood sugar response to small doses of insulin injected intravenously occurs within 18 to 35 minutes from the time of injection, and that the fall in blood sugar ranges from about 25 to 79 mg. per cent. There was a more rapid fall in blood sugar and a more prompt return to normal from intravenous than from subcutaneous injection. It is well known that in the ordinary insulin tolerance test, in which small doses of insulin are given subcutaneously, the maximum fall in blood sugar occurs at varying intervals from ½ to 2 hours. Sakel(14), in his monograph on insulin shock treatment in 1938, also emphasized the slow response to coma doses of insulin given subcutaneously. This is in agreement with the physiologic experiments already cited.

In conformity with the fact that the blood sugar falls more rapidly in response to small doses of insulin given intravenously as compared with subcutaneously we find the same to be true for coma doses. In our series the average maximum fall of blood sugar after coma doses given intravenously was 56.2 mg., occurring in 40 minutes. This is fairly close to the figures stated by investigators who gave small doses of insulin intravenously. The lowest point of their curves came closer to 30 minutes, but it is possible that we might also have found this to be true if we had drawn specimens every 15 minutes instead of every 20 minutes during the first hour. In response to subcutaneous administration of coma doses of insulin, the average maximum fall of the blood sugar was about 47 mg. in 1½ hours. This corresponds closely to the average maximum fall of 40.4 mg. as stated by Kaplan and Low(3) when 10 units of insulin was given subcutaneously. It is difficult to ascertain when this occurred in their cases because specimens were drawn at ½, 1, 2, and 3 hours, and the fall may have been greater between the first and second hours than what they considered to be the maximum. The great difference between large and small doses by

[2] Since this paper was prepared for publication an article appeared in the Archives of Neurology and Psychiatry (43: 925, May, 1940), by P. Polatin, H. Spotnitz and B. Wiesel, on "Effects of Intravenous Injection of Insulin in Treatment of Mental Disease." The report was fairly well confined to clinical studies. The maximum dose of insulin used by these authors was 90 units. A comparison of this effect with that obtained in response to subcutaneous administration was not attempted.

either mode of injection is that in the former the blood sugar stays down long enough for the patient to go into coma. Since we did not permit the patients to stay in coma for over an hour, we cannot say how long this hypoglycemia might continue.

B. Comparison of Average Pre-Coma Time

Table II shows the average pre-coma time for each patient in response to insulin, given subcutaneously and intravenously to the same patients. It demonstrates that in every case

TABLE II

Average Pre-Coma Time and Average Coma Dose of Amorphous Insulin

Name	Subcutaneous		Intravenous	
	Av. coma dose, units	Av. pre-coma time, hours	Av. coma dose, units	Av. pre-coma time, hours
Female				
1. C. M.	150	5.3	89.0	3.8
2. V. P.	106.6	4.0	110.0	3.2
3. M. S.	199.5	3.8	196.7	2.9
4. S. B.	68.0	3.8	70.0	2.7
5. E. C.	101.2	4.0	144.5	3.6
6. V. E.	100.0	4.5	100.0	3.5
7. L. L.	117.0	4.0	114.0	3.1
8. R. W.	91.0	3.7	75.9	2.8
Male				
9. J. M.	104.2	3.2	129	2.5
10. E. M.	129.5	3.3	175.0	2.5
11. D. L.	120.0	3.4	121.0	2.5
12. R. W.	140.0	3.0	140.0	2.4
13. C. J.	150.0	3.0	150	2.2

coma was produced more rapidly by means of intravenous administration. The minimum shortening of the interval was 0.4 hours (24 minutes) and the maximum was 1.5 hours (90 minutes). The pre-coma time ranged from 2.2 to 3.8 hours by the intravenous route and from 3.0 to 5.3 hours by the subcutaneous route.

If the days alone were considered on which the patients were given a known stabilized coma dose of insulin, it would be even more apparent that the pre-coma time was about an hour or more shorter by the intravenous route. This difference in pre-coma time is in conformity with the previous observation that the fall in blood sugar is about one hour faster in response to intravenous medication with insulin. It is evident that after the blood sugar has decreased to a significantly low level it must remain there for a certain time before coma ensues. A study of the precoma time on days on which the blood samples were drawn reveals that after the blood sugar has fallen to the significantly low level of about 30 mg., this level must be maintained for a variable period of from 1.5 to 3.0 hours before coma sets in. This is true for either mode of administration.

Our findings conform generally with those of Freudenberg(15), who maintained that "coma began after the blood sugar had remained at least one hour and 20 minutes, at most 2 hours and 50 minutes, below 30 (total reduction 35) mg. per cent." However, we agree with Kaplan and Low(3) that Freudenberg's figure must by no means be considered as absolute and that apparently the important factor is the significant drop in blood sugar maintained over a sufficiently long period (about 1½ to 3 hours). This is borne out by the fact that the shortening of the pre-coma time with intravenously administered insulin is merely the result of the more rapid fall in blood sugar.

C. Comparison of Subcutaneous and Intravenous Insulin Doses Necessary for Production of Coma

Table II also shows a comparison of the average dose of insulin necessary to produce coma in each patient by the two modes of administration. In the last two cases there was not sufficient variation in the dose when the mode of administration was changed from subcutaneous to intravenous, and therefore they should not be considered. Of the remaining eleven cases, six required approximately the same average coma dose of insulin by both routes of administration. Three patients required more and two others required less insulin by the intravenous method in order to produce coma. It may be said that in the majority of these patients approximately the same amount of insulin was required by both methods.

D. Comparative Frequency of Complications

In the group of 13 patients there were 154 comas produced by intravenous and 162

by subcutaneous medication. Therefore, a comparison of the number of complications by each mode of administration should be statistically valid.

There was only one serious complication. In J. M., a man, aged 36, a lung abscess developed while insulin was being given subcutaneously, but this may have been due to faulty technic of tube feeding. He recovered from the abscess.

Two female patients showed a moderately severe reaction to insulin given intravenously, but none when it was given subcutaneously. The reaction occurred within five or ten minutes after the injection and consisted of a fit of coughing, flushing of the face, fairly marked dyspnea, rapid pulse and a pounding headache. In neither case was it necessary to interrupt treatment for the day and the patients were again comfortable in about fifteen or thirty minutes. This reaction occurred once in each patient after an interval of two days without treatment. A similar but more serious reaction to a coma dose of intravenously administered insulin was seen in a third female patient not included in this series. It also followed a lapse of two days without treatment. This reaction was sufficiently severe to interrupt treatment, and the patient was comfortable in a short time. To avoid reactions of this kind it is advisable to give a subcoma dose on the first day after a lapse of treatment in such patients.

Three female patients had one or more convulsions while under treatment. One had 4 with insulin given intravenously and 2 with insulin given subcutaneously. Another had 2 convulsions with intravenously and none with subcutaneously administered insulin. The third had one convulsion after insulin was given subcutaneously. With so few convulsions the difference in frequency cannot be indicative of any increased danger when the intravenous route is chosen. The significant point is that with intravenous administration the convulsions occurred during the first two hours, and with subcutaneous administration after the third hour. In no case was treatment interrupted.

Two male patients showed occasional secondary hypoglycemic reactions in the afternoon when receiving insulin subcutaneously. Neither had any such reactions with intravenous injections. One patient had prolonged coma for three hours, after subcutaneous injection, but emerged without sequelæ.

An interesting point was the spontaneous emergence from coma after intravenous administration of insulin One patient so emerged twice after one hour of coma, and another six times in from fifteen minutes to one hour after the onset of coma. These were the only 8 instances during 154 comas. No instance of spontaneous emergence occurred in 162 comas from insulin administered subcutaneously. The figures are of no significance, since spontaneous emergence from coma is known to occur after subcutaneous administration of insulin. A priori, one might expect a higher incidence of spontaneous emergence from coma after intravenous administration because it has been shown that restoration of the blood sugar is more prompt after small intravenous doses. However, in order to produce coma a large dose of insulin given intravenously is necessary and restoration of the blood sugar does not occur sufficiently rapidly to rouse the patient from coma.

Conclusions

1. In a group of 13 schizophrenic patients the blood sugar fell more promptly in response to coma doses of amorphous insulin given intravenously than to those given subcutaneously.

2. The fall in blood sugar in response to coma doses of insulin given intravenously occurs at about the same rate as in response to small doses—*e.g.*, 10 units. In the latter case the blood sugar returns to normal values rapidly, whereas in the former it stays low for a prolonged time, so that coma ensues.

3. The only practical advantage of the intravenous administration of insulin is the shortening of the pre-coma period.

4. There was no appreciable difference in the coma doses required between the two methods of administration.

5. There was no significant difference in the complications resulting from the two methods of injection.

6. Spontaneous emergence from coma produced by intravenous insulin is rare.

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THE EFFECT OF NICOTINIC ACID IN STUPOR, LETHARGY AND VARIOUS OTHER PSYCHIATRIC DISORDERS[1]

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Psychosis has long been recognized as a frequent and prominent feature of pellagra(1, 2). In the recent literature attempts have been made to distinguish and classify various psychiatric pictures which develop in frank pellagra(3, 4). Prompt improvement in the psychosis of pellagra by treatment with nicotinic acid has been reported frequently(3, 5, 6). It has also been noted that other patients, lacking definite evidence of pellagra, but complaining of malaise, mild gastrointestinal disturbances and nervousness, often show rapid and impressive improvement or recovery when given nicotinic acid(3, 7). These cases, referred to by Spies and his coworkers(3) as "subclinical and mild pellagrins," are described as having had definite signs of pellagra in the past and as suffering from vague complaints strongly suggestive of neurasthenia or hypochondriasis. In this paper Spies and his associates do not refer to any subclinical cases (that is to say cases without physical signs of manifest pellagra) showing gross personality disturbances such as actual coma, delirium or frank psychosis; nor is there a reference to the neurotic complaints described having been treated in any patients without previous histories of pellagra.

Other observers(8) subsequently reported the prompt and complete relief of comatose and stuporous states in patients lacking signs regarded as necessary for the diagnosis of pellagra. Most of the cases in this series had no history of a previous illness that could be interpreted as pellagra. Most of them showed a mild glossitis consisting of dryness and abnormal redness but without papillary atrophy, a type of tongue generally considered as indicative of toxicity or dehydration rather than of pellagra. In some there was no glossitis and none showed dermatitis or diarrhea. They were without evidence of what could be classified by the ordinary criteria as even a mild pellagra. Their mental symptoms were profound, many having been entirely unconscious for days. These patients could not properly be referred to as subclinical cases for, in some instances, they appeared to be moribund. Weinberg(9) has recently reported the prompt recovery of a patient suffering from severe psychotic confusion after coramine was administered as a cardiac stimulant. The diagnosis of avitaminosis was made only in retrospect, no evidence of pellagra having been present. Jolliffe and his coworkers(10) have reported patients with marked clouding of consciousness, some of whom showed definite neurologic signs, who were greatly benefited or cured by the administration of nicotinic acid. Many of these patients also were free from the recognized signs and symptoms of pellagra.

Spies and his associates have reported(3) that nicotinic acid even in large doses and over long periods failed to bring about any improvement in a series of 26 cases of psychosis not associated with pellagra. Among the psychoses in this series delirium tremens is listed. Mainzer and Krause(11) on the other hand report the prompt and spectacular recovery of a patient with delirium tremens treated with a large dose (500 mg.) of nicotinic acid. This patient is reported to have had stomatitis, glossitis and diarrhea.

The present report is based on a series of 29 cases, all showing severe psychiatric symptoms (Table I). None of these patients had signs or symptoms that would have justified the diagnosis or even a serious suspicion of pellagra. Only one (No. 17) had a history of pellagra in the past, and in this case no signs of pellagra had been present for several years. In contrast to the

[1] Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

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TABLE I

Patient	Race Age Sex	Mental status	Duration of psychosis	Complications	Tongue	Other signs of avitaminosis	Additional	N.A. before result	Time before result	Result
1. J.J.	W 78 M	Semistupor.	Several days.	Prostatic resection. Myocardial damage. Arteriosclerosis.	Coated.	None.	N.P.N. 32 mg.	700 mg. orally.	48 hours.	Clear. Rational.
2. D.E.	W 26 F	Hysteria. Lethargy.	Several days.	None.	Normal.	None.	.....	300 mg. I.V.	24 hours.	Alert, still hysterical.
3. S.H.	W 65 F	Semistupor. Disoriented.	Undetermined.	Arteriosclerosis. Hemiplegia.	Red, not slick.	None.	.....	600 mg. I.V.	48 hours.	Alert, but disoriented.
4. M.H.	W 67 F	Semistupor.	Several days.	Diabetes mellitus. Fractured femur.	Red.	None.	.....	100 mg. I.V.	24 hours.	Clear. Rational.
5. L.P.	W 57 F	Stupor.	1 day.	Arteriosclerosis. Myocardial degeneration. Conduction deafness.	Red, not slick.	Achlorhydia.	.....	300 mg. I.V.	24 hours.	Clear. Rational.
6. S.M.	C 82 M	Comatose.	2 days.	Prostatic resection. Arteriosclerosis. Myocardial damage.	Red, coated, not slick.	None.	.....	200 mg. I.V.	10 hours.	Clear. Rational.
7. J.C.	C 68 F	Semistupor. Confusion.	Several weeks.	Arteriosclerosis. Severe amblyopia.	Coated, slick at edges.	None.	.....	600 mg. I.V.	48 hours.	Clearer. Relevant.
8. I.S.	W 68 M	Stupor.	5 days.	Prostatic resection. Arteriosclerosis. Myocardial damage.	Normal.	None.	N.P.N. 28 mg.	150 mg. orally. 300 I.V.	34 hours.	Clear. Rational.
9. C.C.	W 34 M	Confusion. Disoriented.	3 days.	Peptic ulcer.	Coated.	None.	Had been on sippy diet 9 weeks.	3000 mg. orally. 900 I.V.	72 hours.	Clear. Insight poor.
10. J.K.	C 49 M	Delirium. Semistupor.	3 days.	Arteriosclerosis. Arteriosclerotic heart disease.	Coated, red, not slick.	None.	.....	300 mg. I.V.	24 hours.	Clear. Rational.
11. F.H.	W 69 M	Stupor. Delirium.	3 days.	Prostatic resection. Arteriosclerosis. Nephrolithiasis.	Coated.	None.	N.P.N. 28.5 mg.	150 mg. I.V.	8 hours.	Clear. Rational.
12. R.S.	W 46 M	Lethargy.	Several weeks.	Headache. Dizziness.	Red, slick in middle.	None.	.....	900 mg. orally.	72 hours.	Clear. No complaints.
13. B.D.	W 47 M	Typical delirium tremens.	6 hours.	Strangulated hemorrhoids.	Normal.	None.	C.S.F. pressure 100 mm. H_2O.	300 mg. I.V.	24 hours.	Clear. Good insight.
14. L.D.	W 60 F	Stuporous. Incontinent.	2 days.	Arteriosclerosis. Nephritis.	Dry.	None.	.....	1200 mg. I.V.	96 hours.	Clearer.
15. F.J.	W 42 M	Hebetude.	Several weeks.	Carcinoma of esophagus.	Coated, red, slick.	None.	Obvious malnutrition.	600 mg. I.V.	48 hours.	Clear. Rational.

TABLE I—CONTINUED

Patient		Race Age Sex	Mental status	Duration of psychosis	Complications	Tongue	Other signs of avitaminosis	Additional	N.A. before result	Time before result	Result
16.	M.B.	W 34 F	Delusional. Confused.	7 days.	None.	Normal.	None.	Alcohol in the past.	900 mg. orally.	72 hours.	Clear. Rational.
17.	W.H.	W 46 F	Irrational. Confused.	3 years.	None.	Red, not slick.	None.	Alcoholism. Bromidism in past.	30 gm. orally.	6 weeks.	Clear. Rational.
18.	E.W.	W 44 M	Delirium tremens. Disturbed.	1 day.	Drainage perirectal abscess.	Normal.	None.	.....	300 mg. I.V.	12 hours.	Clear. Good insight.
19.	J.K.	W 67 M	Hebetude. Confusion.	1 week.	Hypertension. Arteriosclerosis.	Normal.	Alae Nasi Scaly.	Dysphagia on admission.	900 mg. I.V.	72 hours.	Clear.
20.	M.J.	W 82 F	Stupor. Delirium.	2 months.	Arteriosclerosis. Coronary disease.	Dry, red.	None.	.....	600 mg. I.V.	48 hours.	Clear. Rational.
21.	G.H.	W 68 M	Semistupor. Confusion.	Several days.	Prostatic resection. Arteriosclerosis. Hypertension.	Coated.	None.	N.P.N. 75 mg.	300 mg. I.V.	24 hours.	Clear. Rational.
22.	J.B.	W 78 M	Lethargy. Confusion.	Several days.	Prostatic hypertrophy. Arteriosclerosis.	Coated.	None.	N.P.N. 50 mg.	300 I.V. 150 mg. orally.	24 hours.	Clear. Rational.
23.	J.R.	W 66 M	Manic. Confusion.	4 hours.	Sciatica.	Coated, edges red.	Sciatica.	.....	100 mg. I.V. (approx.)	15 minutes.	Clear. Rational.
24.	B.S.	W 72 M	Semistupor.	1 week.	Fractured femur. Arteriosclerosis.	Red, not slick.	None.	.....	225 mg. orally.	72 hours.	Clearer.
25.	L.H.	W 40 M	Manic. Confusion. Disoriented.	Several days.	Compound fracture of femur. Infection.	Coated.	None.	.....	500 mg. orally.	36 hours.	Clear. Rational.
26.	J.J.	W 73 M	Disoriented. Confusion.	4 days.	Pneumonia. Arteriosclerosis.	Geographic.	None.	Geographic tongue cleared under treatment.	900 mg. I.V.	72 hours.	Clear. Rational.
27.	W.C.	W 73 M	Confusion. Lethargy.	4 days.	Arteriosclerosis. Pneumonia.	Coated.	None.	.....	800 I.V. 1800 mg. orally.	96 hours.	Clear. Rational.
28.	J.A.	W 77 M	Stupor.	Undetermined.	Arteriosclerosis.	Dry, slick.	None.	.....	4500 mg. orally.	72 hours.	Clearer.
29.	J.E.	W 41 M	Delirium tremens.	1 week.	None.	Normal.	None.	.....	300 mg.	12 hours.	Clear. Rational.

patients cited in our previous report(8), all of whom showed stupor as the most prominent symptom, many of the cases now reported showed active psychotic reactions. Some (9, 13, 16, 17, 18, 23, 25, 26, 29) were not lethargic at all but were on the contrary, actively disturbed. Manic excitement, delusions, hallucinations and disorientation were prominent. Other cases (1, 5, 6, 8, 14, 15, 28) were typical of those described in our previous report. The three cases of delirium tremens in our series, unlike the mens (Nos. 13, 18, 29) would have made a similarly prompt recovery without the treatment given. While this, of course, is possible, it scarcely seems likely, particularly in view of the fact that all three of the patients were growing rapidly worse at the time nicotinic acid was given. The recovery from psychosis was much more prompt and complete than any we have observed before in patients with delirium tremens treated according to the usual methods(12, 13, 14). Some of the patients had also been given thiamin chloride

TABLE II

DAILY OBSERVATIONS OF NUTRITIONAL CASES SHOWING MENTAL SYMPTOMS

Excr.	Incont. always. Bow. Bl.	Incont. sometimes. Bow. Bl.	Uses bed pan but does not ask for it.	Asks for bed pan.
Food	Tube fed.	Hand fed.	Needs encouragement to eat.	Eats spontaneously.
Consc.	No response to stimuli. (Coma.)	Confused response to stimuli. (Stupor.)	Some relevance to stimuli or questions. Dull when alone. (Lethargy.)	Clear.
Verbal	None.	Irregular and irrelevant.	Regular response with some confusion.	Open and alert.
Eyes	Constantly closed. Not open to stimuli.	Open to stimuli. Not when addressed.	Opened when addressed. (Staring.)	Open and alert.
Attention	Not obtained.	Obtained with difficulty.	Obtained easily but indifferent when alone.	Active interest in surroundings.
Conation	No response to requests.	Confused response to requests.	Relevant response to requests.	Spontaneously talks and makes requests.
Insight	No awareness that he is ill.	Vague awareness of confusion.	Fair idea of past. Confusion.	Accurate appreciation of past confusion.
Affect	None evident.	Inconsistent or minimal.	Dulled or disproportionate the appropriate.	Relevant and keen.
Face	Blank.	Dull.	Responsive.	Alert.
Delirium	Actively disturbed.	Delusional, restless, hallucinated.	Restless.	Quiet.

Orient.	Name.	Place.	Date.
Memory	Knows what food was eaten at last meal. Gives name of examiner.		

Patient .....Date .....

case reported by Mainzer and Krause, showed no symptoms suggestive of pellagra.

Many of these patients were admitted to the hospital after coma or psychosis had developed. Others became psychotic or stuporous while in the hospital for surgical treatment. The duration of the psychosis prior to treatment varied from several years (No. 17) to a few hours (No. 23). Usually the response to nicotinic acid was prompt, often it was spectacular. In most instances hypertonic glucose and other treatment for dehydration and toxæmia had been administered before nicotinic acid was used. It might be argued that some of the patients, particularly the three cases of delirium tremens, would have made a similarly prompt recovery without the treatment given. While this, of course, is possible, it scarcely seems likely, particularly in view of the fact that all three of the patients were growing rapidly worse at the time nicotinic acid was given. The recovery from psychosis was much more prompt and complete than any we have observed before in patients with delirium tremens treated according to the usual methods(12, 13, 14). Some of the patients had also been given thiamin chloride in large doses and without apparent effect on the psychosis or stupor. In our previous report we cited one such case who received thiamin chloride not only intramuscularly but also intrathecally without response.

In an effort to lessen subjectivity as well as to enhance concreteness in estimating degrees of improvement we have recently used forms which are checked daily by a member of the house staff (Table II). It is, of course, difficult to design a form of this sort sufficiently elastic to permit registration of all degrees and aspects of consciousness or alertness. Though this record represents only a tentative effort and is open to modification, it has been found helpful.

CASE 23.—J. R., a white man aged 66, was admitted to the University Hospital December 13, 1939, in a state of manic confusion which had developed suddenly several hours earlier. Eight months before admission he had begun to complain of abdominal distention, belching, malaise and pain in the right leg. He went to a physician who made the diagnoses of diabetes mellitus and sciatica. He was treated with insulin and dietary restriction and also given symptomatic medication for the sciatic pain. About a month before admission he came under the care of another physician who discontinued insulin and instituted vitamin therapy with nicotinic acid, 600 mg., thiamin chloride 10 mg. and riboflavin 2 mg. daily by mouth. The patient improved slightly and regained 5 pounds of 30 pounds he had lost, but continued to suffer with sciatic pain. He complained also of restlessness, malaise and constipation up to the onset of his psychosis.

On admission the patient was disoriented, agitated and entirely irrational. He was unable to interpret his surroundings, tried to leap out of bed, shouted in broken sentences, was constantly and purposelessly hyperactive. No definite or consistent delusional trend appeared. The patient's confusion was profound. Sodium nicotinate, 150 mg. in 300 c.c. of physiological saline, was given by venoclysis. About 15 minutes after the administration was begun and while the solution was still flowing into the vein the patient became quiet and cooperative. His confusion and agitation disappeared almost immediately. He spoke rationally and relevantly and showed no evidence of the psychosis which had been so prominent a few minutes earlier.

Temperature was 98.6, pulse 84, respiratory rate 20 and blood pressure 142 systolic, 102 diastolic. The tongue was coated and the edges were red but glossitis in the ordinary sense was not present. There was tenderness over the right sciatic nerve and some tenderness in the muscles of the right leg and thigh. Laboratory examinations showed the blood sugar 182 mg.; but no sugar was found in the urine. Sodium nicotinate, 300 mg. intravenously, was continued until December 19 when oral administration was substituted.

The patient remained free from any signs of psychosis or confusion. His sciatic pain persisted. On December 26 saline injected into the sacral canal gave the patient considerable relief. He was dismissed December 27. The failure of thiamin chloride therapy to relieve the sciatic pain in this case suggests that this symptom was probably not the expression of neuropathy due to avitaminosis (thiamin chloride).

CASE 6.—S. M., a colored man aged 82, was admittted to the University Hospital February 23, 1939, giving a history of urgency, frequency and difficulty in voiding for the past year. On admission the temperature was 98° F., pulse 60, respiratory rate 20, blood pressure 130 over 70. The prostate was moderately enlarged and there was urinary retention. Severe arteriosclerosis and arteriosclerotic heart disease were evident. Laboratory examination showed pus cells and *B. coli* in the urine. The non-protein nitrogen was 30 mg.; P.S.P. output was 35 per cent. The sensorium was clear and the patient was alert and rational. On March 4, under spinal anesthesia, a transurethral prostatic resection was performed. After the operation the temperature rose to 104.4° F. Under treatment for urinary infection and administration of hypertonic glucose solution intravenously symptoms were promptly controlled and the patient improved physically. After the operation a marked change in his mental status was immediately noted. Consciousness was seriously clouded and the patient was entirely irrational and disoriented.

Despite the rapid physical improvement the patient's stupor deepened. Usually he did not respond to moderate stimuli at all and strong stimuli elicited only vague, blundering, negativistic reactions such as twisting or pulling away. Sometimes the patient grunted or muttered inarticulate words or word fragments. On March 9, when seen by the psychiatric consultant, the patient was in a definite coma. He lay inert, with eyes closed or blankly staring, and did not respond to words or ordinary stimuli. Tube feeding had become necessary and the patient was incontinent. The tongue was coated, dry and more red along the edges than normally but no true glossitis as seen in pellagra was present.

Sodium nicotinate, 100 mg. intravenously, was administered on the morning of March 9, and repeated during the same afternoon. Within two or three hours after the first injection the coma seemed less deep. Ten hours after the first nicotinic acid the sensorium was entirely clear, the patient spoke rationally and was cooperative. The treatment was continued for seven days during which the patient was alert and rational at all times. Intravenous administration was discontinued on March 16, and 25 mg. of nicotinic acid three times daily by mouth was begun. On May 18, having recovered from his operation, in good physical condition and in a normal mental status, the patient was dismissed. No further disturbance of consciousness had been noted.

CASE 18.—E. W., a white man aged 44, was admitted to the University Hospital August 21, 1939, for surgical treatment of a perirectal abscess. There was an odor of alcohol about the patient and, though rational and cooperative, he showed moderate evidences of intoxication. Both the patient and his family stated that, except for moderate amounts of whiskey during the three days prior to admission, he had stopped drinking entirely for a period of six weeks. Before that time he had drunk to excess, consuming between a pint and a quart (approximately) daily. He had seldom, however, become drunk enough to be disabled and stated that he had not suffered from hallucinations or any noticeable amnesia. His wife confirmed his statement that he "very rarely became drunk." He worked regularly and was regarded by his employers as an able and valuable man despite his drinking. He had not missed more than a few days from work because of drink over a period of many years.

Operation for perirectal abscess was performed August 22. Condition after operation was excellent.

This patient remained rational and without any signs of a personality disorder until August 23, when, during the night, he began to see monkeys and little Negro boys dancing on the transom. At first he seemed to realize that these apparitions were imaginary, but soon becoming disturbed and uncooperative he began to believe they were real. Next day he insisted on leaving the hospital against medical advice and went home.

When seen at his home during the afternoon of August 23, he was in constant action. No sooner could he be induced to take to his bed than he would spring up frantically again and, seizing the broom or a fly swatter, belabor the bare walls with uncommon vigor and assiduity. "Those damn bugs, they're three feet long," he shouted repeatedly. He described great multicolored bugs, grotesquely formed, which he saw advancing along the wall in phalanxes, spitting at him and hissing as they came. It was in effort to repel these hallucinatory monsters that he strove. When his attention could be gained he was well oriented and not grossly irrational about general matters. Efforts at examination were, however, interrupted each moment by wild scrambling about the room in which the patient leaped over beds and chairs yelling curses at his imaginary attackers and offering vivid descriptions of what he saw. Although he seemed at times to be alarmed, he was not actually terrified but seemed rather to be enthralled with interest though determined to drive off the dragon-like bugs, snakes, monkeys, spiders and other chimeras that threatened. There was no definite tremor.

He was returned to the hospital. In order to achieve sedation which was urgently needed, sodium amytal, gr. 7½, and sodium luminal, gr. 15, were given intravenously at 5.30 p. m. These drugs were administered slowly and it was not until he had received the full amount that he became calm enough to stay in bed. He was also given 50 cc. of 50 per cent glucose intravenously. Despite this extremely large amount of sedative drugs the patient became disturbed again at 9.30 p. m. Paraldehyde, 12 drams, was given by mouth during the night, the last dose being at 2.30 a. m. At 11.30 p. m. he had received nicotinic acid, 150 mg. intravenously.

When the patient woke up next morning the sensorium was entirely clear, he was rational and completely free from hallucinations. Nicotinic acid was continued, 300 mg. intravenously, daily until August 28, when the patient was dismissed without recurrence of any personality disorder.

CASE 17.—W. H., a white woman, aged 46 years, was seen in her home August 10, 1939. Four or five years previously this patient had frank pellagra with dermatitis, glossitis, gastrointestinal disturbances and psychosis. She was treated and recovered after a few weeks of illness. She had used alcohol to excess for many years. For two years preceding the present instance (August 10, 1939) marked personality disorders had been prominent. During this period the patient remained well oriented most of the time but was restless and complained of anxiety as well as of vague and varied somatic distresses. Frequently, however, she became definitely confused and disoriented, expressed fragmentary delusional ideas and was irrational in her behavior. She often spoke of people coming into her room at night to harm her and sometimes at night she sprang from the bed shouting that people or animals were after her. She took bromides and barbiturates as well as considerable amounts of alcohol over this period of two years and twice suffered a typical bromide intoxication psychosis. During these illnesses she was hospitalized and the blood bromide was found to be 500. She recovered from the bromide intoxications but her almost constant restlessness, her periods of acute confusion, delusions and hallucinations persisted. Sometimes these periods lasted only a few hours but at other times they continued for several days or a week. Even when she was prevented from taking alcohol, bromides or barbiturates, she still had these psychotic periods. When free from the drugs her sensorium was clear most of the time and her irrationality was less marked. Her judgment could not, however, be relied upon for, becoming confused, she would begin again and again to use drugs.

On August 10, 1939, she was well oriented and cooperative, but showed little insight into her condition. For weeks she had been confused during the day time and at night she disturbed the household by her turbulent and irrational behavior. Physical and neurologic examination showed nothing significant except a tongue redder than normal. No true glossitis, dermatitis or other sign of frank pellagra was present.

Nicotinic acid, 600 mg. daily by mouth, was begun. Within five days the appearance of the tongue had become normal. The patient's psychotic spells were less frequent and less severe but they still occurred. Even when not frankly psychotic she was moody, irritable and showed defective judgment and insight. Nicotinic acid in this amount was continued for 30 days with no additional improvement. The patient's mental status continued definitely better than before treatment had been started however.

On September 9, nicotinic acid was increased to 1500 mg. daily by mouth. After six days the patient became entirely clear. She no longer suffered from periods of confusion or delusional episodes. Her judgment and insight showed marked improvement. After two weeks the dose of nicotinic acid was reduced to 900 mg. by mouth daily. The patient is still taking 900 mg. daily. She has shown no evidence of psychosis during this time, a period of over nine months, and she has been able to avoid bromides, barbiturates and excessive drinking. She does her house work satisfactorily and is making a good adjustment.

DISCUSSION

The changes noted in the mental status of these patients were no less impressive than those mentioned in our previous report(8) on a series of 19 cases all of whom showed

varying degrees of stupor. Fourteen cases (1, 2, 3, 4, 5, 6, 8, 12, 14, 15, 19, 24, 26, 27) in the present series showed a similar psychiatric picture in which clouding of consciousness was the sole feature. In five cases (7, 11, 20, 21, 22), however, misinterpretation of the surroundings, irrational excitement, purposeless behavior and fleeting delusions were prominent although consciousness was distinctly clouded. Six cases (9, 16, 17, 23, 25, 26) showed little or no hebetude but were actively psychotic. In all of these patients delusions, hyperactivity, disorientation and grossly irrational behavior constituted the psychosis. They were typical cases ordinarily diagnosed as toxic psychosis(15), exhaustion delirium(16), or perhaps, psychosis, type undetermined. Such patients are familiar to all physicians who have had experience in psychiatric hospitals and are not rare in the general hospital. Not infrequently one finds it difficult to determine what toxic agent or what stress is responsible for the psychosis. We have seen many such cases, diagnosed as *toxic psychosis* or exhaustion delirium in which no adequate cause could be named. We have also seen many similar cases classified as psychosis, type undetermined, and treated only by symptomatic measures. Among the six patients now under discussion peptic ulcer (9), fracture of the femur (25) and mild pneumonia (26) might be regarded as complications. The response to nicotinic acid would seem, however, to leave little doubt that the real cause of the psychosis was an avitaminosis, sufficiently severe to produce a psychosis but without other indication of its presence. Two other cases (16, 17) had no complications at the time, though both had used alcohol to excess in the past and one (17) had formerly suffered from pellagra. Case 23 had a mild sciatica which might be considered as indicating an avitaminosis (thiamin chloride). The sciatica did not, however, improve on treatment with the appropriate vitamin. Case 23 developed a psychosis while taking considerable amounts of nicotinic acid (600 mg. daily by mouth) yet made sudden and spectacular recovery when sodium nicotinate was administered intravenously. Case 17 remained psychotic despite the administration of 600 mg. of nicotinic acid daily but recovered when given 1500 mg. daily.

The prompt and striking recovery of three cases showing the typical psychosis of delirium tremens (13, 18, 29) would seem to leave little doubt that the psychosis in these instances was due primarily to avitaminosis. Whether or not more than one vitamin deficiency is responsible in such cases is another question.

Seven of the cases (2, 3, 7, 9, 14, 24, 28) listed showed improvement only. The nicotinic acid therapy did not furnish a complete and permanent solution for their psychiatric problem. One remained (2) psychoneurotic, others showed persistent intellectual and emotional impairment which apparently was related to cerebral arteriosclerosis, senility or other factors. Even in these patients, however, one can scarcely escape the conviction that a nicotinic acid deficiency was in part responsible for the psychiatric condition. In the other 22 cases the chief psychiatric problem was solved by the vitamin therapy.

Many of the patients in this series were taking diets which supplied nicotinic acid and other vitamins in amounts ample for the average person. It has already been mentioned that one (23) developed a psychosis while taking nicotinic acid in amounts larger than those usually necessary to cure active pellagra. One is therefore led to the conclusion that in the illness of patients here discussed factors other than dietary deficiency played important rôles. It is a matter of common knowledge(17) that failure to absorb vitamins from the gastrointestinal tract and failure to store and utilize vitamins, such as occurs in disorders of the liver may lead to avitaminosis even when large amounts of vitamins are ingested. The need for all vitamins which have to do with carbohydrate metabolism is naturally increased in febrile conditions, during periods of extraordinary exertion and under all circumstances which augment metabolic activity. Other factors yet undetermined and perhaps unsuspected may also influence the failure of the nurones to receive and utilize an adequate supply of vitamin.

Summary and Conclusions

Thirty-eight patients in stuporous states or in active psychoses without evident cause

showed prompt and often very impressive improvement after treatment with nicotinic acid.

The usual criteria for the clinical diagnosis of pellagra or of other deficiency syndromes were absent.

This experience leads us to believe that many patients whose psychiatric status suggests the diagnosis of toxic psychosis or exhaustion delirium may be relieved of their symptoms by the administration of nicotinic acid. It is believed that in such cases and in cases who show unexplained clouding of consciousness a therapeutic trial of nicotinic acid is the only means available by which one can determine whether or not the psychosis is due to avitaminosis.

In some exceptional cases, even when clinical evidence of pellagra is absent, extremely large amounts of nicotinic acid are necessary to obtain satisfactory results.

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DISCUSSION

CHARLES D. ARING, M. D. (Cincinnati, Ohio).—Sebrell and Butler (Experiments on riboflavin deficiency in man, U. S. Pub. Health Reports, 1939, 54, 2121-2131) have suggested that in order to avoid further confusion, the diagnosis of pellagra should be confined to that syndrome which responds to nicotinic acid. If this thesis is followed, and if one uncritically accepts the literature on the subject, the field of the vitamin deficiencies will widen to include nearly all of medicine, and most of neurology. I would like to suggest why this thesis cannot be followed even though all the clinical writings on the vitamins be valid.

I shall confine my remarks chiefly to the effect of nicotinic acid on the cerebral circulation. When one injects nicotinic acid into an arm vein in man, and measures the cerebral blood flow before and after this procedure, it is found that there results a marked increase in the cerebral blood flow after the injection. This response has been obtained in seven cases. The increased cerebral blood flow lasts for at least 15 minutes with intravenous doses of 20 to 40 mg. To date we have not determined the maximum duration of this effect. In measuring cerebral blood flow in man by the plethysmographic method of Ferris (Relative intracranial blood flow in man, J. of Clinical Investigation, 1940, Proc. Soc. of Clin. Research, in press), we have found that the increase averages approximately 20 per cent in individuals without evident nicotinic acid deficiency. This finding may be correlated with that of Moore (Treatment of multiple sclerosis with nicotinic acid and vitamin B1, Arch. Int. Med., 1940, 65, 1-20) who noted that the pial arteries in the brain and spinal cord of a cat dilated after the intramuscular injection of 48 mg. of nicotinic acid.

No change in the systemic blood pressure results from the injection of nicotinic acid in man. Neither is there a rise in the body temperature nor in respiratory rate. If cerebral blood flow increases and dilatation of the pial arteries occurs, and there is no alteration in systemic blood pressure, it seems reasonable to assume that cerebral function may improve if the cerebral symptoms are due to deficient cerebral circulation. This would hold whether the patient was suffering from a nicotinic acid de-

ficiency or not. Surely we believe that the relief of temporary circulatory disturbances of the brain results in profound change in neurological behavior. The syndrome known as "hypertensive encephalopathy" might be cited as an example. According to our work a reduction of cerebral blood flow occurs in patients suffering from so-called "hypertensive encephalopathy." We know how often these patients may "compensate," so to speak, and apparently recover from their abnormal cerebral manifestations. Although the physiological effect of an increase in carbon dioxide on the cerebral circulation is comparable to that of nicotinic acid, we do not postulate a carbon dioxide deficiency because of its cerebral action. Therefore one should thoroughly evaluate the pharmacological aspects of the vitamins before attributing their action to a deficiency of the same in the body.

The psychiatric service of the Cincinnati General Hospital is extremely interested in delirium tremens and has had a vast experience with this material. In recent studies by Rosenbaum and his group it was found that the average duration of the acute psychotic episode in 234 cases of delirium tremens was 2½ days. Sixty-five of a total of 234 patients on routine treatment, without the use of vitamins, cleared within 24 hours of the time they were first observed. They have used nicotinic acid (by mouth or parenterally) in 18 cases without shortening the duration of the psychotic episode, or the length of the entire course of delirium tremens. They are not impressed with the efficacy of nicotinic acid in other psychotic states not associated with pellagra, nor in stupor associated with the psychoses.

In consideration of the studies made by Drs. Sydenstricker and Cleckley it would seem to be a good policy to administer nicotinic acid to the type of case that they have described. Physiological consideration tends to encourage this policy. It will probably be wise to refrain from attributing these disorders to avitaminosis until more evidence is at hand.

HERMAN WORTIS, M. D. (New York City).—Drs. Sydenstricker and Cleckley have reported on the nicotinic acid treatment of 28 psychotic patients whose predominant symptoms were stupor and delirium. It is noteworthy that none of these cases showed any of the manifestations of pellagra, which we usually associate with a deficiency in nicotinic acid.

At the Bellevue Psychiatric Hospital, Dr. Norman Jolliffe and his associates have recently reported 150 cases of an encephalopathic syndrome which they believed to be a nicotinic acid deficiency. The syndrome is rather clear-cut and is characterized by clouding of consciousness, cogwheel rigidities and uncontrollable sucking and grasping reflexes. Many of the cases described by the authors may have fallen into this clinical group, but their paper makes no mention of the presence or absence of sucking and grasping reflexes.

As regards the use of nicotinic acid in the treatment of delirium tremens, a word of caution is necessary. We have recently completed a study at Bellevue, designed to discover the physiological and metabolic changes which accompany delirium tremens. Thirty per cent of our cases with delirium tremens had peripheral neuropathy, indicating a gross deficiency in vitamin B1. Many showed pellagrous lesions and all showed a marked deficiency in vitamin C. We concluded that nutritional factors were of great importance in the production of delirium tremens. The complexity of the problem and the difficulty in evaluating therapeutic procedures is emphasized by our findings in four cases of delirium tremens that were treated with glucose, saline and a diet that was *totally* inadequate in the entire vitamin B complex. Two of these cases recovered promptly and the other two took a marked turn for the worse, necessitating intravenous vitamin medication, before recovery took place. Prior to treatment, I could see no essential difference in the severity of these cases.

I have, however, seen many cases enter the hospital with delirium and then develop the typical nicotinic acid encephalopathy with marked clouding of consciousness, cogwheel rigidities and uncontrollable sucking and grasping reflexes. These cases invariably die unless they are given nicotinic acid.

In addition, great difficulties arise in evaluating the genesis of a psychotic episode in any particular individual. For example, case 18 is that of a 44-year-old alcoholic who entered the hospital for the surgical treatment of a peri-rectal abscess. The factors to be evaluated in the genesis of his psychotic episode are the following:

1. His pre-psychotic personality.
2. The patient was a chronic alcoholic. It is well known that alcoholism not only reduces the oxygen uptake of the brain, but that there are disturbances in carbohydrate utilization. That nicotinic acid deficiency can contribute to these metabolic difficulties is suggested by the work of the authors.
3. The operation, the anesthetic used, and the psychological and metabolic upset which attend such procedures.
4. His treatment with sodium amytal, sodium luminal and paraldehyde.
5. His treatment with nicotinic acid.

Were we dealing in this case with a specific nicotinic acid deficiency or did nicotinic acid augment brain oxidation in non-specific fashion so that normal functioning again became possible? Do the authors believe that this restoration to normal functioning could have been obtained by any other method? Furthermore, have the authors seen similar pictures which did not respond to nicotinic acid therapy?

It has been known for years that the adequate functioning of the brain is dependent upon a carbohydrate substrate and an adequate supply of oxygen. In addition, various enzyme and co-enzyme systems are necessary for the proper break-down and utilization of this carbohydrate by the brain. Among the most important of these systems are vitamin B1 and nicotinic acid.

The authors are to be commended for bringing to our attention this noteworthy addition to therapeutics in psychiatry. While one may question the

specificity of nicotinic acid therapy in some of their cases, the hard and important fact that 28 psychotic patients were made well by the use of this substance is a discovery of first-rate importance.

Dr. Hervey M. Cleckley.—The effect of nicotinic acid, mentioned by Dr. Aring, in dilating cerebral arterioles impresses me as a very interesting observation. It is, of course, possible, perhaps probable in some cases, that the beneficial effect we observed after the administration of nicotinic acid was the result of this dilatation rather than the correction of an actual deficiency state. The fact that many of our patients maintained a marked improvement, and some a recovery, suggests, however, that a true avitaminosis was at least sometimes present. The sudden emergence from confusion noted in case 23 suggests that the effect of nicotinic acid in this instance was probably a direct result of increased cerebral blood flow as described by Dr. Aring. I agree with Dr. Aring that one should be cautious about assuming that patients who improve after treatment with vitamins are necessarily cases of avitaminosis in the ordinary sense. It seems, however, an interesting fact that stuporous and delirious patients often respond favorably to the administration of nicotinic acid.

Cases of delirium tremens in my own experience have on the average taken longer to clear up than two and a half days. I hardly think this could be because most of them attained their status by drinking "Georgia corn." The three cases reported recovered so rapidly after the administration of the nicotinic acid that a causal effect seems likely. I do not mean to go so far as to say that all cases of delirium tremens or even most cases would respond similarly.

We have observed a few cases showing forced grasping and sucking who apparently were of the type described by Dr. Jolliffe and his co-workers and classified as encephalopathy with nicotinic acid deficiency. The majority of our cases did not seem typical of this syndrome. Many of our cases showed evidence of cerebral arteriosclerosis and I believe that the effects of nicotinic acid deficiency as well as the effects of cerebral arteriosclerosis contributed to their personality disorders.

THE PSYCHOPATHOLOGY OF THE HIT-AND-RUN DRIVER [1]

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One of the most serious problems in interpersonal relationships is that which has been created within the last twenty years as the result of the increased use of the motor car. From the standpoint of psychiatry, the most serious group of offenders who come into traffic court are those who have damaged property or injured or killed persons and who have fled without making any attempt to correct the damage that has been done or to put themselves in a position where the injured party might be helped or recompensed.

To the psychiatrist, the automobile itself can be regarded as an instrument of flight or escape in certain situations although the psychiatrist is better acquainted with flight from reality and intrapsychic escapes from specific individual problems, such as sex or social adjustment, as well as the various fugues, all of which are buried in a multiplicity of symptoms and devices for concealment. In the usual psychiatric case it may be only by interpretation that we are able to evaluate the escape mechanism, except in multiple personality and psychogenic amnesia in which it is more apparent.

In the case of the hit-and-run driver we have an example of flight in its purest sense. In order to make a study of this type of psychological escape mechanism, the clinic examined fifty cases which appeared consecutively before Judge Thomas Maher of the traffic court. They were all charged with the offense of "Leaving the Scene of an Accident." These cases were given psychiatric, psychological and socio-psychiatric examinations. In addition, they were given nineteen mechanical aptitude tests to rule out every possible factor that might explain this type of behavior. It is not necessary to describe these methods in detail as they have been described in other articles.[2, 3, 4]

When these cases were diagnosed it was found that the unstable psychopath predominated and accounted for 40 per cent of the cases; the egocentric type of personality, 12 per cent; mentally defective individuals, 22 per cent; the chronic alcoholic with deterioration as a major condition, 10 per cent; psychoneurosis, anxiety type, 4 per cent of the cases; the remainder were divided between schizoid personality and physical conditions without psychosis. Only 2 per cent were without any type of deviation. The individuals who were diagnosed as unstable psychopaths showed definite mood changes and instability during the examination, as well as being so described in their daily contacts by others who had known them for some time. It is of interest to note the lack of psychotics in this group charged with "Leaving the Scene of an Accident." We find that while they are involved in other types of traffic violations they are not, as a group, motivated by this escape mechanism. However, since this group is a limited one it is possible that a larger selection might include some psychotic cases. The total percent of psychotic cases in all crime groups examined in the clinic over a period of ten years runs 15 per cent.

The threshold situation when a death occurs as the result of the accident is entirely different. The tension created by the various social factors and the internal emotional factors makes this a critical situation. It has

[1] Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 24-28, 1940.

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[3] Selling, Lowell S., "Mental pathology found in automobile drivers," J. Crim. Psychopathology, Vol. 1, No. 3, January, 1940.

[4] Selling, Lowell S.; "Personality traits observed in automobile drivers." J. Crim. Psychopathology, Vol. 1, No. 3, January 1940.

been the assumption that "Leaving the Scene of an Accident" in a panic is characteristic of youth. When we compare the ages of the hit-and-run group with the general age distribution throughout the City of Detroit, it is apparent that there is no significant difference in the age range. We find that accidents of this type begin to occur at the age of licensed drivers and a few occur before that period. They reach their peak between the ages of 20-24, and maintain a fairly constant distribution with a slight decrease through the remainder of the age groups. The actual range of ages in the fifty cases studied is from 15 to 54. While there is a high percentage of offenders in the 20-24 group, youth and inexperience may not be considered a major cause but merely a contributing factor. It is interesting to note that there is only one woman among the fifty cases, and this is known to be a lower proportion than the number of women drivers actually driving in the city.

TABLE I

A Comparison of Number of Alcoholics Found in Two Groups of Traffic Offenders [5]

	Hit-run drivers	Per cent	500 traffic offenders	Per cent
Alcoholism	24	48.0	179	35.8
Chronic alcoholism ...	5	10.0	76	15.2
Total	29	58.0	255	51.0

In this hit-and-run group of drivers the psychiatrist feels that alcoholism is an important factor. This is borne out by the findings shown in Table I.

This table compares the number of alcoholics found in a group of hit-and-run drivers with a group of 500 traffic cases examined in the Recorder's Court Traffic Clinic. In 62 per cent of the cases the driver admitted that he had been drinking at the time the accident occurred. This would indicate that alcoholism is first of all an important factor in the hit-and-run situation, and it is also true that the psychopathic personality which predominates in this group has a tendency to resort to alcohol.

In regard to the general intelligence in the group we have again compared the hit-and-run driver with the total traffic group examined in the clinic, and we find that 32 per cent of the hit-and-run drivers fall into the defective group, while in the total traffic group examined 52 per cent fall into the same group. The range in intelligence in the hit-and-run group is restricted on the upper and lower limits but still shows a wide range in intelligence quotient from 44 to 116 on the standard tests of general intelligence. It must not be forgotten that the 500 cases were selected because of their bizarre behavior at the time of their court hearing. We can conclude, however, that intelligence is one of the factors in the hit-and-run offense just as in all types of traffic violations.

It is assumed by the public that, if people are well educated, they know more about law and order and should keep themselves under better social control. An analysis of the educational achievement of this group shows a normal distribution. There are no illiterate individuals involved in this particular offense although there are about 5 per cent illiterates in the group passing through the psychopathic clinic of the Recorder's Court during a year. Educational achievement of the group ranges from elementary through secondary and college levels. The median amount of education is eighth grade, consequently neither education nor illiteracy is a factor in this specific type of offense.

Only two racial groups were held for this violation. The colored group comprises 10 per cent and the white 90 per cent of the group. Although the white race predominates there is a higher percentage of Negroes among the hit-and-run group than is the proportion found in the general population.

There are a number of other elements which enter into this problem, namely, fear of arrest, failure to have a license on the person as ordered by law in Michigan, and failure to have ever secured a driver's license. It is interesting to find that 26 per cent of these offenders had no license. Any one or all of these circumstances may explain why some of these individuals left the scene of an accident.

[5] "The psychiatric findings in the cases of five hundred traffic offenders and accident-prone drivers." From the Psychopathic Clinic of Recorder's Court, Traffic Division, Series T-16.

Of the fifty individuals in this group only one had a superior knowledge of the traffic laws. The group was given a true and false test on the traffic laws which quickly revealed lack of information or wrong information. Twenty-two had an adequate knowledge, 32 per cent only fair, and 44 per cent had meager knowledge of the traffic laws. Undoubtedly, not knowing the law would give a clue why some of these offenders left the scene.

One raises the question of how far this flight tendency will go. It is interesting to note that many of these individuals were found within the vicinity of the offense or returned to the scene of the offense.

More than half, 58 per cent, placed the blame on themselves though they felt the accident to be unavoidable. In 17 other cases the other vehicle involved was parked at the curb, 32 per cent blamed the other driver, 8 per cent felt that both parties were equally to blame, and in 4 per cent the individuals were too confused to be able to place the blame. A check on the driving experience of the drivers involved in the accidents shows this group to be on the whole an experienced group. Only 4 cases have driven less than one year. The range is from 2 months to 30 years; the median driving experience is 12 years. The highest numbers are found in the groups driving from 5 to 10 years—28 per cent; and 15 to 20 years—22 per cent. Length of time driving does not apparently give the driver sufficient poise so that he will accept responsibility for his behavior. From a psychiatric standpoint it is interesting to observe who notified the police of an accident, particularly when the offender left the scene. The complainant was able to identify the car and made the complaint in 22 per cent, eye witness in 14 per cent, 26 per cent unknown source, 8 per cent were arrested at the scene, 6 per cent gave self up, 6 per cent were found to be owners of abandoned cars.

Following apprehension, 46 per cent still feel that the accident was unavoidable, 48 per cent felt that it could have been avoided. In the latter group there is evidence of conflict, and those individuals who have attempted to escape and are now confronted with their guilt are willing to accept punishment as a means of expiating their sense of guilt. The hit-and-run group has a surprisingly high record of previous traffic offenses as well as other criminal offenses. The range in traffic violations was 1 to 18 previous tickets, and 1 to 13 previous criminal offenses.

TABLE II

NUMBER OF ARRESTS CHARGED TO HIT-AND-RUN DRIVERS

Traffic arrests	Other arrests	No. of cases	Per cent
0	0	3	6.0
0	1	3	6.0
0	2	2	4.0
0	4	1	2.0
0	9	1	2.0
1	0	6	12.0
1	1	1	2.0
1	2	1	2.0
1	3	2	4.0
2	1	1	2.0
2	2	1	2.0
2	5	1	2.0
2	13	1	2.0
3	0	2	4.0
3	1	1	2.0
4	0	3	6.0
4	2	1	2.0
5	1	2	4.0
5	2	1	2.0
6	0	4	8.0
6	3	1	2.0
6	5	1	2.0
6	12	1	2.0
7	1	1	2.0
8	2	1	2.0
9	1	1	2.0
10	1	1	2.0
11	0	1	2.0
12	0	1	2.0
14	1	1	2.0
15	3	1	2.0
18	0	1	2.0
Total.. ..		50	100%

Table II shows the previous criminal record of these men to be such that they do not wish to face the conviction and probable severe punishment that will be theirs when their past driving record becomes known. They also run the chance of the permanent loss of their driving privilege.

The nativity of these drivers shows 44, or 88 per cent, were native born, and 12 per cent were foreign born, 38 per cent were born in Michigan. Others came from states

where there are few or meager laws governing driving of a car.

Occupationally the group is predominately a marginal one economically. They are without specific skills, 16 per cent are laborers, and they are individuals who probably cannot afford to pay for the damage which has been done. Actually they cannot afford to drive a car at all if they must assume 100 per cent liability for their actions.

TABLE III

PHYSICAL FINDINGS ON 50 HIT-RUN DRIVERS

Physical Findings	No. of cases
Eyes:	
Internal strabismus, left eye	1
Color blind	1
Error of refraction	4
External strabismus, left eye with marked loss of vision in that eye	1
Blind right eye and markedly diminished vision in the left eye	1
Teeth and mouth:	
Pyorrhea	7
Oral sepsis	10
Carious teeth	5
Septic tonsils	21
Dental caries	1
Poor oral hygiene	2
Edentulous mouth	1
Skin:	
Acne of face	1
Seborrhea of the face	1
Question of chancroid	1
Gastro-intestinal system:	
Carcinoma of rectum	1
Endocrine:	
Colloid goitre	2
Obesity	1
Nodular goitre	1
Cardio-circulatory system:	
Mild hypertension on emotional basis	1
Hypertension	5
Mitral stenosis and insufficiency	1
History of gonorrhea	6
Active gonorrhea	1
History of lues	1
Physical handicaps:	
Amputated left thumb	1
Amputated first finger, left hand	2
Amputated left fourth finger	1
Injured left fourth finger	1
Deformity of right hip with shortening of lower right extremity	1
Deformity right index finger	1
Deformity of back	1
Inguinal hernia	3
Old fracture of nose	1
No pathology:	
No abnormal physical findings	5
Good general physical condition	3
Undernourished	1
Poor general physical condition	1
Alcoholism:	
Chronic alcoholism	1
Alcoholism	2

Although there are 103 physical disabilities among individuals charged with hit-and-run driving, few of these disabilities have any bearing on their ability as drivers. These physical disabilities fall into the following classes, 8, or 16 per cent, show visual defect. Endocrine disability is found in 4 cases. In the cardio-circulatory system we find 6 cases of hypertension and 1 case of mitral stenosis with insufficiency. This latter group, though small, could have a distinct bearing on the problem of driving. There are 12 individuals showing physical handicaps, but only 2 conditions on the surface appear to constitute a driving risk; deformity of hip, and deformity of back. Ten present no physical pathology, 3 present physical deviation due to excessive use of alcohol. On the routine examinations given by the Board of Health in the clinic, 3 of the fifty cases returned positive Kahns indicating presence of active syphilis.

Findings on the battery of physical tests to rule out any cause for the present type of accidents are as follows on the depth perception tests: 27 out of the fifty cases have better than normal depth perception; 23 cases show increasingly poor perception tests; for perimetric vision, 2 showed slightly restricted vision for both eyes and one bad definite restriction on one side.

DISCUSSION

The mechanisms responsible for a driver leaving the scene of an accident are as numerous as the individuals committing the offenses. The chief conscious reasons given by our cases who have failed to stop and to render aid to a victim or to report damage are: (1) *Unaware of the accident.* Strangely enough, this lack of awareness of damage that has been done is reported by patients who have done bodily harm rather than property damage. Of five cases where persons were killed by motorists who later were apprehended, three denied any knowledge of the accident until they were informed of it by the police. I am inclined to believe that

there is a subconscious motive operating in cases of this sort which causes the patient to claim not to be aware of the accident whereas the fact that he has had an accident has really been noted by him but has been suppressed. In these five cases, the police reports indicated that the patient sped away from the scene of the accident; that is, that the speed was definitely increased and that he was fleeing from the situation in which he was involved. There was more evidence of speeding in leaving the scene of an accident in those cases where the individuals did not have a driving license than in the group who were properly equipped; persons who had long arrest records also were observed to drive more speedily, according to witnesses.

A case to illustrate this point is that of T 279. This man had served three terms in the penitentiary and one in a corrective school for boys. He felt that the police were not giving him a fair chance, after he had gone straight for four or five years. The psychiatric picture showed him to be a very egocentric individual; he tried to evade the issue, admitting that he looked around to see if there were any observers, and when he saw that there were none, drove away as fast as he could. He tried to deny he knew a child was injured but it is obvious that he drove away rapidly after looking around for any observers, and was surely aware of the excitement he had caused and probably saw the child.

There are features in his background which would explain the patient's desire to be "unaware of his conduct." Because of his bad record and the fact that he had been alcoholic in the past and had had a drink on the day in question he could hardly fail to realize that serious consequences might very well await him.

When apprehended he became rather dramatic, showing great bewilderment and demonstrating how badly he felt when he got to court by putting his arm around the shoulder of the youngster and saying that he would not have hurt him for the world as he had a little boy about his age at home. The offense was definitely his fault as he had been driving too fast and admitted day-dreaming.

Another element in hit-and-run accidents is what we call (2) *"non-background fear."* This is illustrated by the patient who has no bad background, no prison record, is properly equipped with a driver's license and against whom there are no formal negative facts to be lodged when a complaint is made. These individuals are afraid of extraneous elements.

For instance, one case reported that he, a white man, committed an offense in a negro area and people around him showed such resentment against him that he feared he might be harmed. Investigation showed that most of the colored witnesses had been unaware of what happened, did not know that he was a white man, and probably did not respond in the way that he interpreted the matter.

Another individual who illustrates this point T 277, is a thirty-two-year-old white single male, was born in Missouri, who failed to come to a complete stop for a light and crashed into a car that was coming at right angles to him. His description of his own mental state was that he "became excited, abandoned his car and ran away." We found that he has a physical defect, for one leg was shorter than the other, and he had an error of refraction which should have been corrected by glasses before he was allowed to drive.

Psychiatrically, we found him to be an irritable person who had been involved in a lot of minor trouble—he had no formal record but was easily irritated and highly defensive. Much reason for this attitude was elicited; he had no home background, had been brought up by foster parents who rather abused him and he had developed feelings of inferiority about not having any parents of his own and also because he was deformed. He was distinctly ingratiating in attitude almost to the point of sycophancy in an attempt to cover up his inadequacy and irritability. In the general psychiatric field, however, no pathology was noted.

A third type of reaction was found in the group, particularly in (3) *the feebleminded cases.* They did not know they should stop and render aid and did not know there was a law demanding such conduct on their part. Their usual explanation was that they were driving along minding their own business and another car came in contact with them. They claimed, as a rule, that the collision was the other person's fault (although evidence showed the reverse to be true) so they continued driving, leaving the scene of the accident, because they concluded that the damage done to their cars was greater than that done to the other cars.

We have another type of case which is of importance—that of the (4) *schizoid individual.* He is *indifferent to the harm that he does.* We have two cases illustrative of this type of individual. The accidents in both cases occurred at night with but slight property damage; however, it was necessary to chase these violators for several blocks to apprehend them and bring them to court. They were able to make restitution, had no

records, and there was no obvious reason why they should flee from the scene of the accident. The psychiatric examination brought out the finding that there was a dissociation between the social responsibility and individual intellectual picture which, although not great enough to prevent them from making an ordinary daily adjustment, did permit such action as this in an emergency.

Conclusion

We can conclude from the foregoing information that any mental deviation is likely to result in fleeing from the scene of an accident. There is a definite type of malfunction which makes certain types of unstable and otherwise psychopathic people flee from the scene of an accident—they are not conscious of the necessity of salving the damage that they have done, or they are likely to go into a flight reaction when there is no need. They evaluate features of their past or present in such a way that their thresholds of social responsibility are lowered. The solution of these problems is definitely one in which the psychiatrist should take part.

Recommendation

There are some recommendations that can be made in view of the facts mentioned and these are: (1) The feebleminded should be highly trained and coached if they are to drive at all; (2) the psychoneurotic should not be permitted to enter an automobile when in a highly unstable or upset state; (3) persons with a bad background who are improperly equipped mentally or physically for driving should be especially warned and their problems must be dealt with in psychiatric fashion; (4) potential traffic offenders (and these are all growing people) should be diagnosed and given appropriate treatment before they reach the age where they will commit a hit-and-run offense. Such preventive measures would aid greatly in solving the problems brought up in this paper.

THE PSYCHOLOGY OF REPEATED ACCIDENTS IN INDUSTRY[1]

By ALEXANDRA ADLER, M.D., Boston

The occurrence of repeated accidents in certain individuals has, for a great many years, aroused much concern and interest among industrialists, psychologists and physicians. As early as 1907, Alfred Adler(5), in his "Study of the Inferiority of Organs and Its Psychic Compensation" discussed the case of a person who had suffered repeated accidents, with injuries to his eyes. He pointed to the possibility that an organ inferiority may be used under certain psychological conditions for the production of a neurotic symptom. Based on a study of 3000 workmen, Marbe(10), in 1926, showed that the probability of meeting with an accident is greater in the case of a person who had previous accidents. He was the first to prove the existence of an "accident habit" by statistical material. Since then many attempts have been made to explain this accident-proneness by psychological tests. Until now all these attempts have failed. It was not possible to prove that accident-prone individuals had poor ability to concentrate, poor manual abilities, slow reaction time or other qualities demonstrable by tests.

In 1930, the author had the opportunity of examining 100 industrial workers in Europe who had had repeated accidents (3, 4) varying in number from 4 to 36. In the last six years 100 American workmen, who had suffered accidents have also been studied. Most of these patients were examined during the course of legal proceedings of the Industrial Accident Board of Massachusetts for the settlement of claims for compensation. Thirty of the hundred had had two or more accidents. The workers were laborers, grinders, machinists, locksmiths, carpenters and drivers. The results of the study of the American and European workers were in the main quite similar but there were some numerical differences.

During the investigation of these patients a complete history was taken and an attempt was made to study their personalities. Dreams, childhood recollections, and their emotional reaction to the accident were included in the examination. In addition to the general physical examination, the patients were studied from a constitutional angle(6) and psychometric tests as used in industry were made. These included testing of manual ability, concentration and reaction time. As a control an analogous examination was made of twenty workers who never had had an accident.

TABLE 1

130 Workers with Repeated Accidents

	American workers	European workers
1. Revengeful attitude	4 (13.2%)	56 (56%)
2. "Unlucky"	7 (23.1%)	10 (10%)
3. Longing to be pampered	6 (19.8%)	6 (6%)
4. Over ambitious	2 (6.6%)	4 (4%)
5. Over fearful	8 (26.4%)	3 (4%)
6. Alcoholics	1 (3.3%)	12 (12%)
7. Feebleminded	1 (3.3%)	7 (7%)
8. Organic diseases	1 (3.3%)	2 (2%)
Total	30	100

Neither the psychometric nor the constitutional examination showed any significant difference between the control group and the accident-prone workers. The psychological examination, however, did show certain striking features which recurred with such frequency that it was possible to divide the patients into 8 groups. In discussing these groups, as shown in Table 1, the last three need only a brief comment. The alcoholics had definite signs of chronic alcoholism, such as continuous tremors. Many of them were intoxicated when they reported for work as can be seen from the rate of accidents occurring in the morning and afternoon. In the alcoholics, the accidents occurred more than twice as frequently in the morning as in the afternoon. In the other groups the ratio was about equal. The feebleminded had a very low grade of intelligence, they

[1] Read before the American Psychopathological Association, Cincinnati, Ohio, May 19, 1940.

From the Neurological Unit, the Boston City Hospital and the Department of Neurology, the Harvard Medical School.

could not count or write more than their names. It is understandable that they were unable to follow the routine. In the other groups, the intelligence was equal to that of the average population. Of the three workers who had organic diseases, the American worker suffered from cerebral arteriosclerosis; one of the two European workers was subject to petit mal attacks, during which the accidents occurred, whereas the second one was a post-encephalitic Parkinson and his slowness of movement interfered with his work. The psychological structure in these twenty-four patients with organic disease or subject to chronic alcoholism was quite different from that found in the remaining accident-prone workers. The cause of the repeated accidents in this group of twenty-four was a physical one.

Although national differences cannot be stated from the relatively small number of cases examined, the difference between the number of alcoholics in Europe (12 per cent) and in the United States (3.3 per cent) is worthy of note.

Among the remaining groups, the first numbered 60 patients, all of whom showed a definitely bitter and revengeful attitude toward their parents or educators who were blamed by these workers for their unhappy life. They usually stated that their parents had forced them to take up an occupation which they did not like. Now, they said, the parents could see what the outcome was. If they had followed their original wishes to become artists or teachers, for instance, they wouldn't have become cripples. Their childhood was marked by difficulties in relation to school and relatives. One third of this group harbored serious ideas of suicide, which were not present in the remaining groups. But no actual attempt at suicide was admitted. We know from experience that suicidal persons usually have a revengeful attitude toward someone whom they want to punish through their suicide. In these workers we may, therefore, consider the accidents as something like a substitute for suicide. Similar ideas have been expressed by a few authors on related subjects (1, 2, 7, 8, 11). One has to understand also, how this revengeful attitude technically can lead to the occurrence of accidents. We must realize that it is of uttermost importance that one *avoid* the possibility of accident. From this point of view one can understand that this group of workers did no try to prevent an accident since they have the urge to prove by their lives that wrong has been done to them. Another interesting fact is demonstrable in workers with repeated accidents (10). They are likely, not only to incur accidents themselves, but it is they who also do the greatest amount of damage to the machinery. This is likely to occur when one has no productive interest in his work but instead a desperate attitude toward it.

A comparison with the attitude toward their occupation in the 20 control workers who never had any accident, showed none of these trends. It should be noted also that in this group the majority reported that they originally had intended to choose another occupation than the one they held; but they did not blame anyone else and had reconciled themselves to their present condition.

The second group consists of 17 workers who called themselves again and again the "unlucky" ones. They had had "bad luck" during their whole lives, starting from earliest childhood. They said that they always were unlucky and did not expect it ever to be different. Half of them were illegitimate children. They behaved like persons who were courting blows. It is understandable that if anyone feels that accidents will happen, regardless of whether precautions are taken or not, as these fatalists did, not much will be done to avoid them.

The third group consists of 12 workmen who always wished to be nursed and cared for. They had been pampered a great deal during their childhood and expected this to continue. Four of them were youngest children and greatly attached to their mothers. They reported that the only time they really felt well, as they had during their happy childhood, was after their accidents, when they were sick and being taken care of. Then they felt like happy children, cared for and nursed by their parents. Here we encounter, therefore, a positive interest in the occurrence of accidents.

Six workmen who constitute the fourth group showed extreme ambition. This was

manifested by their repeated dreams of flying, which typically occur in individuals who want to be more powerful than others. They were usually excellent pupils and always interested in being ahead of the rest. They reported that they even came first in the morning to their factories, sometimes as much as two hours early. They were interested in working better and faster than all the others. Of course they did not apply the necessary precautional measures since their only interest was to outdo the others.

Finally, there were, in the fifth group, eleven workmen who were living in constant fear of accidents. They always had to think of accidents during their work. This overanxiety could be traced back to their childhood. They were timid children who avoided playing games and who never succeeded in learning to swim. They remembered all the different accidents which had occurred to them or to their relatives. The result of such an interest was experimentally proved in a test on soldiers who were sent out on horseback on a cross-country ride.(12) Half of them were told that a ditch was ahead of them and the other half were not informed of its presence. Three times as many soldiers of the group who knew about the ditch, fell into it. This can be explained by the fact that we automatically behave purposefully in certain dangerous situations if we are trained for them but if all our activities are hampered by fear, our automatic reactions are inhibited.

In some of these accident-prone workers the tendency to accidents disappeared after a fundamental change had been made in their lives. For example, one of the workers with a revengeful attitude became a safe, steady worker when his relatives had succeeded in making enough money to enable him to train for the profession which he had desired to follow, although the usual accident rate was larger in his newly-chosen profession. He was now reconciled to life. On the other hand, in many, injuries continued to occur even after they had been put to work where accidents could hardly be expected. They slipped while walking, jammed their fingers in doors, etc., and so demonstrated that the accidents were related to their personality rather than to the type of work.

We can see from all this that a harmonious relation of the worker to his type of work is a fundamental prerequisite in order to avoid accidents to himself and damage to his environment. Whether this ought to be achieved by psychotherapy or by so-called superficial ways of adjustment must be decided according to the personality of the individual with whom one is dealing. The majority of the 130 workers examined were not suitable subjects for psychotherapy because of their bitter and hopeless attitude which would make any deep exploration an unpromising enterprise. It would be much easier, of course, to prevent their wrong development by adequate measures taken during childhood and adolescence.

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PNEUMO-ENCEPHALOGRAPHY IN EPILEPSY[1]

By WILLARD W. DICKERSON, M. D., Caro, Mich.

Dandy(1), in 1919, first obtained satisfactory visualization of the brain structures by introducing air into the spinal canal as a substitute for spinal fluid. One year previously he had reported the injection of air directly into the ventricles to obtain visualization of the cranial contents. Two years later Bingel(2), who introduced the term "encephalography," and Wideröe(3) independently reported similar studies. Since that time many improvements in the technique of the introduction of air(4, 5, 6), or its substitutes(7, 8, 9), type of anesthesia(10, 11, 12), and interpretation of the roentgenograms obtained(13, 14, 15), have taken place. A vast amount of literature has accumulated dealing with the various phases and interpretation of results of this procedure. It has come to be almost routine in the study of a variety of intracranial lesions.

Comparatively few papers have appeared reporting encephalographic studies on a series of epileptic patients as such. Occasional small groups of epileptic patients have been included in reports of studies of all types of patients(5, 15, 17, 18). Foerster(19), Notkin(22), and Gross(23) have published their findings in small groups of epileptic patients. Encephalographic studies of epileptic children and of children suffering from convulsions have been made by the staff of the Royal Aberdeen Hospital for Sick Children(25), and by Gotten(21), Law(26), and Ruggeri(27). Studies of large groups of epileptic patients have been reported by Fay(20), Boening and Constantinu(24), and Fitch, Piggott, and Weingrow(28).

From September, 1935, until December, 1939, the medical staff of the Caro State Hospital for Epileptics made 313 attempts at encephalography on 286 patients. Throughout this period there was a practically constant, although small, operating team and the operative procedure was standardized. After the first few attempts in which sedatives were used orally, we came to depend upon either avertin per rectum or intravenous sodium amytal or pentobarbital sodium as the anesthetic agent. We used unfiltered air entirely for replacing the fluid withdrawn, usually volume for volume. In a few instances in which the first attempt was unsuccessful, we injected considerably more air than fluid removed at subsequent sittings. All of the resulting films have been interpreted by one individual, Dr. V. C. Johnson, assistant professor of roentgenology of the University of Michigan Medical School. We believe that the value of the constant factors in technique and in interpretation of films cannot be overemphasized.

In our series, there have been three deaths attributed to the operative procedure. Two of these deaths we consider as undoubtedly due to excessive medication in uncooperative patients of low mentality. The third patient remained comatose and in poor condition with a high elevation of temperature for two days postoperatively. On the seventh postoperative day he developed bilateral bronchopneumonia and died 24 hours later.

Throughout this study the classification formulated by the Committee on Standardization of Statistics of the National Association for the Study of Epilepsy(29) has been used. Frequently it has been necessary, for statistical purposes, to classify a patient rather arbitrarily, realizing that another grouping might well have been used.

Distribution of patients by classification and by sex and age is shown in Table I.

A brief discussion of the various groups follows:

1. *Exogenous Toxins.*—This group contains one patient, a 29-year-old male with a normal birth and early developmental history. When 5 years of age he drank a large

[1] This is an abridgment of the paper read at the ninety-sixth annual meeting of The American Psychiatric Association, Section on Convulsive Disorders. Cincinnati, Ohio, May 20-24, 1940.

All of the clinical material, without which the paper loses much of its value, has been omitted because of space limitations.

From the Caro State Hospital for Epileptics, Caro, Mich. R. L. Dixon, Medical Superintendent.

quantity of kerosene. Seizures began immediately during the period of unconsciousness which lasted approximately 3 days, and have continued to the present time.

2. *Endocrinopathy.*—One case, a 51-year-old woman, widowed, and the mother of 2 children, who began having seizures with the onset of the menopause. No other cause for her seizures could be found. The physical and neurological examinations were negative, except for a generalized increase in deep tendon reflexes without other pyramidal signs.

a definite history of such involvement, especially as a complication of the acute exanthematous diseases of childhood, was the most important diagnostic feature. Six patients showed varying degrees of Parkinsonism. In this group we have also included cases of acute infantile cerebral hemiplegia of unknown etiology.

5. *Neoplasm.*—In this group we have arbitrarily included 7 cases, 6 of tuberous sclerosis and one of von Recklinghausen's neurofibromatosis, which we realize might well have been placed in the agenesis group.

TABLE I

DISTRIBUTION BY SEX AND AGE

Group	No.	Male	Female	Age by months: 0-50	50-100	100-150	150-200	200-250	250-300	300-350	350-400	400-450	450-500	500-550	550-600	600-650	650-700
Exogenous toxins...	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Endocrine	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Syphilis	6	5	1	..	..	1	..	1	1	2	1	..	..	..	..	..	..
Meningo-encephalitis	51	34	17	..	..	9	7	11	6	8	5	1	3	..	..	1	..
Neoplasms	10	3	7	..	..	..	2	1	1	3	1	1	..	..	..	..	1
Trauma	23	17	6	..	1	2	1	7	4	..	3	1	2	..	..	1	1
Agenesis—birth injury ...	70	44	26	4	7	8	10	11	5	9	5	3	4	3	1	..	..
Agenesis—mental deficiency	33	19	14	..	1	5	9	9	5	2	..	2	..	..	..	..	..
Others	2	1	1	..	..	..	..	..	..	..	..	1	..	1	..	..	..
Undifferentiated, symptomatic ...	31	21	10	..	1	7	3	3	3	3	2	..	4	..	2	2	1
Idiopathic with myoclonia	3	1	2	..	..	..	..	1	2	..	..	..	..	..	..	..	..
Idiopathic	50	26	24	..	..	2	11	7	10	5	9	2	..	2	1	1	..
Unclassified	3	3	..	..	..	..	..	..	..	1	1	..	..	..	1	..	..
Not epileptic	2	1	1	..	1	..	..	1	..	..	..	..	..	..	..	..	..
Totals	286	176	110	4	11	34	43	52	37	34	27	11	13	6	5	6	3

In this group we formerly included a 12-year-old negro boy with a typical Fröhlich's syndrome, whose encephalogram showed a widening of the corpus callosum with either a porencephalic cyst or great dilatation of the posterior portion of the right lateral ventricle. As a result, he is now included in the group "Agenesis and Birth Injury."

3. *Syphilis.*—This group consists of 6 patients, all suffering from congenital syphilis. All show numerous stigmata with positive serological and spinal fluid findings.

4. *Meningo-Encephalitis.*—In this large group we have included those cases in which it seemed that the patient's seizures were due to inflammatory processes involving the meninges, nervous tissues or both. In many

We have also included 3 cases of brain tumor. In one case the diagnosis was confirmed by operation and in another by biopsy. In the third case our diagnosis has been substantiated by neurosurgical consultation; operation was refused by the patient's family.

6. *Traumatisms.*—Here we have included only those cases in which there was a definite history of head injury severe enough to produce disturbance of consciousness or positive neurological findings immediately following the injury. We have arbitrarily disregarded those histories in which the history was indefinite or inconsequential, and confirming neurological evidence was absent.

7. *Agenesis and Birth Injury.*—In this

large group, comprising more than a third of our cases, we have attempted to include those cases in which it was concluded that the epilepsy resulted from a disturbance of development of the central nervous system or to birth injury, either of which resulted in defects, in addition to convulsions, which were obvious in the neonatal and developmental period. The frequency of physical defects and neurological abnormalities is very high. As a rule convulsions occurred at an early age. Many patients were retarded in walking, talking, acquiring proper toilet habits, etc.

We have included as a sub-group, those individuals in whom the only evidence of altered function of the nervous system are convulsions and mental deficiency, which the history clearly discloses to have existed from birth. We consider that mental deficiency alone is as confirmatory of organic defect as are abnormal neurological findings. In those persons manifesting only mental deficiency and convulsions as evidence of brain defect, we have arbitrarily selected an intelligence quotient of 70 as the dividing line between this organic group and the idiopathic group.

8. *Others.*—In this classification we have placed 2 cases. The first is a 36-year-old woman in whom a diagnosis of degenerative brain disease, probably Schilder's disease, has been made. The second is a 46-year-old, mentally deficient male with a combined Marie-Friedreich type of cerebellar ataxia.

9. *Symptomatic, Undifferentiated.*—In this rather large group we have included certain cases in which there is definite neurological and encephalographic evidence of organic brain disease. In many of the cases an accurate history is lacking. The choice of most of these lies between the agenesis and the meningo-encephalitis groups. We have also included a number of patients in whom there is no pertinent history and no physical or neurological evidence of organic central nervous system disease, and whose psychometric determinations indicate a normal or once-normal intelligence, but in whom there is encephalographic evidence of deviation from normal brain structure.

10. *Idiopathic Epilepsy with Myoclonia.*—Here we have included 2 sisters with Unverricht's myoclonus epilepsy, and one 16-year-old boy with typical myoclonic movements occurring at irregular intervals without regard to seizure incidence. None presents other evidence of central nervous system involvement.

11. *Idiopathic, Undifferentiated.*—The relative incidence of patients in this group is much lower than it would have been had only first admissions been included. All patients in this group have normal physical, neurological and laboratory examinations, intelligence quotients now or once normal, and normal encephalograms.

12. *Unclassified.*—We have found 3 patients whom we have been unable to classify properly with the information available, including our encephalographic studies.

13. *Not Epileptic.*—Here we have included 2 patients. One of these is a 21-year-old, single, white male, with an unstable, explosive personality, who displayed occasional epileptiform attacks as a reaction against unpleasant situations. His intelligence quotient was 77. His attacks were completely controlled by simple suggestion and he has been on parole for 5 months, following 14 months of freedom from attacks in the institution. Our formal diagnosis was psychoneurosis, hysterical type; it might well have been idiopathic epilepsy with psychogenic factors. The second patient was a congenitally feebleminded girl, without convulsions, on whom an encephalogram was done at the request of the medical staff of the Lapeer State Home and Training School.

Table II shows in tabulation form the various findings of the patients studied by groups.

There is little information in the literature to explain the occasional unsuccessful attempt at encephalography. In the past little significance has been placed either upon unsuccessful attempts or the presence of incomplete drainage(5, 14, 30, 31, 32). It appears to be the consensus that lack of filling of the ventricles is not an indication of abnormal brain structure, but that it is probably due to some unknown factor affecting the dynamics of the exchange of gas and liquid through the minute openings of the foramina of Luschka and Magendie in the fourth ventricle. As far as we are aware,

no explanations have occurred for the fairly frequent occurrence of incomplete drainage.

We note that in our series in few cases were second, third, and fourth attempts successful (22 per cent). In the symptomatic group with obvious structural disarrangement, undoubtedly some physical basis exists for the failure of ventricular filling. We are especially interested in the unusually frequent occurrence of incomplete drainage in the group classified as agenesis on the basis of mental deficiency. While the encephalograms have been interpreted "normal," or showing "no evidence of abnormality," we believe that this unusually high incidence cannot be disregarded.

Table III shows the relative occurrence of unsuccessful attempts and incomplete drainage for the various groups.

The value of encephalography in institutionalized epileptics may be considered from three viewpoints: diagnostic, prognostic and therapeutic.

(1) *Diagnostic.*—In many cases the encephalogram has no diagnostic value except that of confirming obvious defects already revealed by physical and neurological examinations. In no way may it be considered a substitute for accurate history taking or for physical and laboratory examinations. Occasionally we have been astonished at the lack of correlation between the apparent magnitude of the structural defect and the small amount of functional loss resulting therefrom.

Fay and others (19, 20, 33) have described encephalographic changes which they considered characteristic of epilepsy. They considered only cases of cryptogenic or idiopathic epilepsy. Our findings vary from theirs for two reasons: (1) All types of convulsive disorders have been included in our series. (2) Cases showing encephalographic findings varying from normal have not been placed in, or have been removed from the idiopathic group. Varying interpretations of the classification scheme apparently account for the wide variation in statistics emanating from the several institutions for epileptics using the same classifi-

TABLE II

ENCEPHALOGRAPHIC FINDINGS

Group	No. of patients	Normal	No evidence of abnormality	Brain atrophy or hypoplasia generalized: Symmetric	Brain atrophy or hypoplasia generalized: Asymmetric	Brain atrophy or hypoplasia generalized: Unilateral	Abnormal subarachnoid markings: Increased	Abnormal subarachnoid markings: Decreased or absent: Unilateral	Abnormal subarachnoid markings: Decreased or absent: Bilateral	Calcification: Brain	Calcification: Meninges and inner table	Ventricles not visualized	One ventricle not visualized	Midline retraction	Porencephaly	Cerebellar atrophy
Exogenous toxins	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Endocrine	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Syphilis	6	..	..	..	3	1	..	..	..	..	..	..	..	..	..	..
Meningo-encephalitis ..	51	8	1	10	11	13	3	3	6	1	1	1	1	2	..	..
Neoplasms	10	2	..	3	1	9	2	1	1	6	..	2	..	2	..	..
Trauma	23	3	2	5	2	..	..	..	2	1	..	..	1	3	..	..
Agenesis—birth injury	70	5	3	31	11	6	..	2	4	..	..	..	..	..	3	..
Agenesis—mental deficiency..	33	13	15	..	..	..	1	1	1	..	..	..	..	..	..	..
Others	2	..	..	1	..	..	1	1	1	..	..	..	..	..	..	1
Undifferentiated, symptomatic	31	6	2	10	5	7	..	1	..	1	..	..	..	..	..	1
Idiopathic with myoclonia	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Undifferentiated, idiopathic	50	28	18	..	..	..	1	2	1	..	2	3	1	..	..	..
Unclassified	3	1	..	..	..	..	..	2	..	..	..	..	..	1	..	..
Not epileptic	2	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Totals	286	71	41	61	34	36	8	13	16	9	3	6	3	8	3	2

cation system. In a fairly large number of patients the presence of lesions, which had been otherwise unsuspected, was discovered by encephalography. Seven patients were found in whom physical, neurological, laboratory and psychometric examinations were entirely within normal limits; however, encephalographic studies revealed slight or moderate generalized brain atrophy. These patients would have been classified as idiopathic epileptics had not encephalography been performed.

We have found encephalography of little value in determining the etiologic agent as we have been unable to differentiate the abnormalities of the various groups as shown by encephalography. Structural changes shown by this method are usually the same, regardless of etiology. Since we began using encephalography routinely, there have been 167 new admissions who have been presented at our regular staff meetings for formal diagnosis. Of this number, in 95 cases the encephalographic findings were available. In only 7 cases was diagnosis postponed awaiting encephalography.

Encephalographic studies have also been valuable in the selection of patients for neuro-surgical therapy. This was seen in the meningo-encephalitis, traumatic, and neoplastic groups.

We have encountered 3 cases in whom the encephalogram shows an increase in soft tissue in the region of the corpus callosum giving rise to a wide separation of the lateral ventricles. All 3 cases show a moderate degree of generalized brain atrophy and, in addition, one patient shows a porencephalic cyst in the posterior portion of the right hemisphere. The 6 cases showing varying degrees of Parkinsonism which have been included in the meningo-encephalitis group, with one exception, have shown normal encephalograms. In one case we have suggestive evidence of uncrossed pyramidal tracts.

(2) *Prognostic.*—We do feel that encephalography offers valuable information not obtained by any other method. However, its most valuable aspect is found in the confirmation of obvious neurological findings. The fact that structural changes in the brain are present is convincing evidence to relatives that little can be done to benefit the patient other than the control of seizures by medication and to offer the patient as much training as he is able to assimilate. This prognostic feature is especially valuable, we believe, in the institutional type of patient with which we have to deal.

We have been greatly interested in the problem of mental deterioration in connection with idiopathic epilepsy. It is interesting to note that the 7 patients mentioned above show varying degrees of brain atrophy without clinical evidence of its presence. On the other hand, many cases with far advanced deterioration show entirely normal encephalograms. At the present time it is our opinion that there is little or no evidence to show that there is a relationship

TABLE III

Group	Patients	Attempts	Successful	%	Incomplete drainage but determinate	%	Unsuccessful	%
Exogenous toxins	1	1	1	100	..	..	..	..
Endocrine	1	1	1	100	..	..	..	..
Syphilis	6	7	5	71.4	..	..	2	28.6
Meningo-encephalitis	50	56	41	73.2	8	14.3	7	12.5
Neoplasms	10	17	7	41.2	..	..	10	58.8
Trauma	23	25	24	96	1	4	..	..
Agenesis—birth injury	70	73	51	69.8	16	21.9	6	8.2
Agenesis—mental deficiency	33	35	16	45.7	14	40	5	14.3
Others	2	2	2	100	..	..	..	..
Undifferentiated	31	31	24	77.4	7	22.6	..	..
Idiopathic with myoclonia	3	4	4	100	..	..	..	..
Idiopathic undifferentiated	50	54	35	64.8	15	27.7	4	7.4
Unclassified	4	5	5	100	..	..	..	..
Not epileptic	2	2	2	100	..	..	..	..
Totals	286	313	218	69.6	61	19.5	34	10.9

between gross alterations in structure and deterioration. We hope eventually to accumulate a fairly large series of patients in whom encephalographic changes can be correlated with the changes of this so-called deterioration.

(3) *Therapeutic.*—The introduction of air and other gases into the spinal canal as a therapeutic measure for various neurological conditions has been noted. Daniels(34) reported the beneficial effects of encephalography in a case of post-traumatic narcolepsy. Sharp(35) advised the introduction of oxygen into the spinal canal in the treatment of acute infections of the meninges. Penfield(36) reported the successful treatment of chronic meningeal (post-traumatic) headache by lumbar insufflation.

Bingel(37) has mentioned the beneficial effects of encephalography in control of convulsions in epileptics. Gardner(38) obtained complete relief of seizures in 5 of 14 patients with idiopathic epilepsy for 9 months following encephalography. In addition, 4 of these cases were improved, 3 unimproved and 2 made worse. In 12 of his cases of convulsions occurring as a sequel to head trauma, 4 were relieved, 5 improved, 1 unimproved and 2 made worse.

The only criterion of the therapeutic effect of encephalography which could be measured objectively in this study was that of seizure incidence. We realize that this is not the only criterion of improvement or decline, but it is the only one available for most of the group.

Of the patients studied, there were 122 patients within the institution for 6 months prior to and 6 months following encephalography who either received no medication or whose medication was unchanged, and who suffered no illness during this period. The following tabulation shows the effect of encephalography on seizure incidence in this group:

TABLE IV

THERAPEUTIC EFFECTS OF ENCEPHALOGRAPHY

Seizures decreased first month only	4
Slight decrease in seizures six months	5
Seizures decreased continuously six months	23
Complete remission from seizures six months	2
Unchanged	46
Seizures increased first month only	9
Seizures increased six months	33
	122

It is interesting to note that 2 attempts at encephalography, both unsuccessful, were made on one patient, a white male, age 19, of Italian parentage, who had suffered from convulsions for 5½ years following encephalitis. In the 6 months preceding the first attempt, he experienced 21 seizures; in the 6 months following, but 2 occurred. In the 6 months preceding the second attempt, he experienced 6 seizures, while in the 6 months following, he experienced none.

The following tabulation shows the amount of improvement of those showing a continuous decrease in the number of seizures:

TABLE V

DECREASE IN SEIZURES FOLLOWING ENCEPHALOGRAPHY

Per cent	
0–25	1
26–50	9
51–75	7
76–99	6
100	2
	25

The following tabulation shows the amount of increase in number of seizures of the 33 patients whose seizures apparently were made worse by encephalography:

TABLE VI

INCREASE IN SEIZURES FOLLOWING ENCEPHALOGRAPHY

Per cent	
0– 25	8
26– 50	4
51– 75	6
76– 100	5
101– 250	5
251– 500	3
501–1000	2
	33

CONCLUSION

We have presented a partial review of the literature dealing with encephalographic studies of groups of epileptics, together with a summary of our experience with encephalography in 286 institutionalized epileptic patients. From our studies we believe that we may draw the following conclusions:

1. Encephalography is a valuable and relatively safe procedure in the study of epileptic patients.

2. The value of this procedure has been considered from the standpoint of diagnosis, prognosis, and treatment.

A. There is no lesion characteristic of epilepsy as revealed by encephalography. The structural changes revealed by this method cannot be differentiated with regard to etiologic agent, nor from similar changes in non-epileptic individuals. These changes in themselves are not an essential part of the convulsive disorder, but may be regarded as concomitant or as a result of the same process giving rise to the epileptic manifestations. Encephalography has revealed the presence of lesions in some patients which were not indicated from the history or by the physical and neurological examinations. The relatively frequent occurrence of incomplete drainage and failure of the ventricles to fill with air in the symptomatic groups may indicate that this phenomenon may be of more significance as evidence of abnormality than was formerly believed.

B. The most valuable aspect of encephalography is that of prognosis. The presence of irreversible changes in structure is convincing evidence that often little can be done for the patient other than to render his existence as comfortable as possible.

C. Encephalography is of little value as a therapeutic measure in epilepsy. Only 2 of 122 patients showed complete remission from seizures for a 6-months' period. A relatively small number were improved, a slightly larger number made worse, and the greatest number unchanged. We know of no way by which patients may be selected for the therapeutic effect of this procedure.

We wish to express our deep appreciation of the invaluable assistance given us by Dr. V. C. Johnson, without whose cooperation much of this report would have been impossible.

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DISCUSSION

DR. RAYMOND W. WAGGONER (Ann Arbor, Mich.).—Dr. Dickerson has brought out a number of important facts. The cases have been well studied and well presented. I can vouch for that because I have had an opportunity to see some of these cases.

The presence of brain tumors in a number of these patients seems to me a rather sad commentary on the diagnostic efforts of those who sent the patients to a hospital for the epileptic in the first place.

I think the comment concerning classification is apt; certainly none of us is willing to accept the present classification as satisfactory. Personally, I wish we could get rid of the word "epilepsy" and particularly the term "idiopathic epilepsy." It bears an unfortunate connotation, and we should exclude it from our vocabulary. A further fact brought out, which to me is very important, is that a convulsive disorder is a symptom of a disturbance of the smooth functioning of the central nervous system. I am delighted that the author considered that only a small group would fit into the classification of "idiopathic" convulsive attacks.

I am particularly interested also in the possibility of combining encephalograms and electroencephalograms in the study of such cases from the standpoint of determining the prognosis a little more accurately than we have been able to do in the past. Such procedure might also assist with the prognosis of cases treated with various types of drug therapy, particularly dilantin.

Comment is made about the use of anesthesia in the encephalography procedure. They have used nembutal and sodium amytal. In my opinion it is possible to get better anesthetic results by using a very short-acting barbiturate; sodium thioethylamyl or pental work beautifully and are more or less the same sort of thing as giving an anesthetic, such as ether or nitrous oxide, because of the short action and the fact that it can be given more or less continuously.

In some of these cases in which the cause has been used as a basis for classification, I am wondering whether the author would say something about the possibility that this causative factor might not have been coincidental rather than the actual causative factor of the convulsive attack.

DR. WILLARD W. DICKERSON (Caro, Mich.).—I want to thank Dr. Waggoner for his discussion. We have not tried any of the short-acting barbiturates. We feel that avertin by rectum is our most satisfactory agent. We do feel that the so-called etiologic agent is only coincidental. We are very much dissatisfied with our present classification scheme which is on an etiologic basis.

NOTES ON THE PROBLEMS OF SUICIDE AND ESCAPE[1]

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Suicide and escape are two of the most serious problems with which the psychiatrist has to deal. Both of them represent failures of judgment in the management of the mentally ill. The two problems are psychologically closely related for suicide may be looked upon as escape in its most absolute and irrevocable form. At times, indeed, unauthorized departure from an institution is simply a preliminary step in the carrying out of a plan of suicide. In our experience the incidence of suicide and escape problems closely parallel each other. For these reasons it seems justifiable to treat them together.

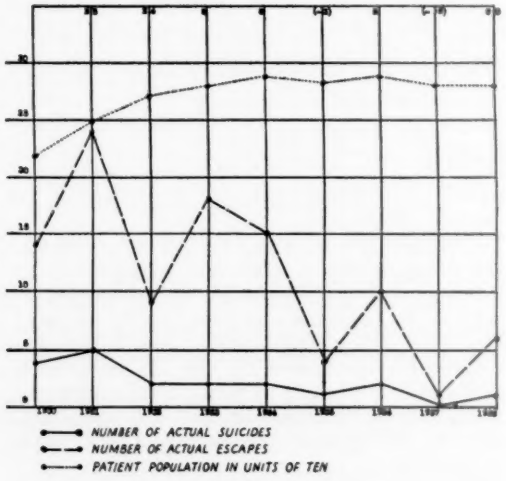

FIG. 1.

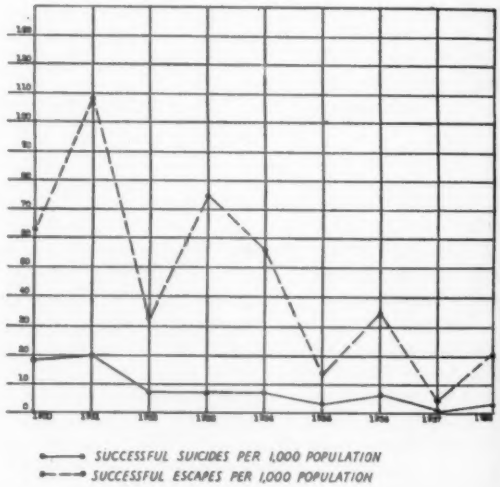

FIG. 2.

Most of the studies on these problems deal either with mass statistics or with detailed analysis of motives prompting the patient. A few deal with practical methods of preventing these emergencies. It is hoped that the present discussion may contribute somewhat to the latter aspect of the problem.

Because of certain peculiarities of our situation at the Sheppard and Enoch Pratt Hospital it has happened that some of the factors potentially influencing suicide and escape have been more or less excluded or kept constant over a considerable period of time. This permits us to study the factors which have varied with a view to determining which are significant for us. This does not mean that the factors so excluded have no bearing upon these problems generally. It means only that they are not significant in our setting.

This study covers the years 1930 to 1938 inclusive. It was prompted by the observation that although our hospital population rose from 222 in 1930 to 280 in 1938, the number of successful suicides had decreased from 4 in 1930 and 5 in 1931 to none in 1937 and only one in 1938 (Fig. 1). Moreover, the trend had appeared to be progressively downward not only for successful suicides but also for successful escapes as well as attempts at suicide and escape (Figs. 2, 3, and 4).

Our first thought was that perhaps the results simply reflected our personal experience with a possible general trend in the United States with a peak of suicides during the depression years and gradual decrease since. When we compared our results, how-

[1] Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

From the Sheppard and Enoch Pratt Hospital.

ever, with the curve for suicide in the United States over the same years, a decided difference appeared (Figs. 2, 3, 4, and 5). In order to compare these it was necessary to

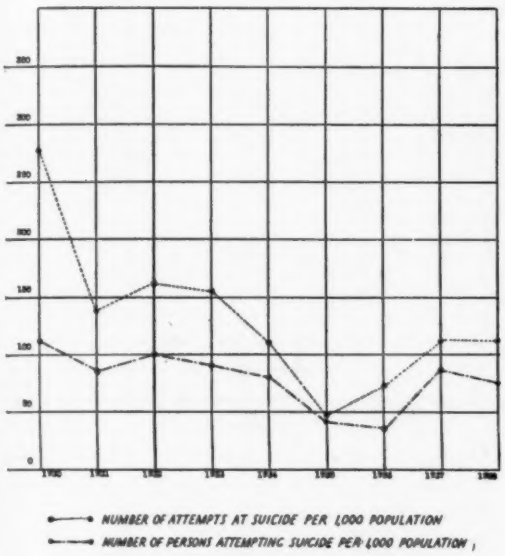

FIG. 3.—Suicide.

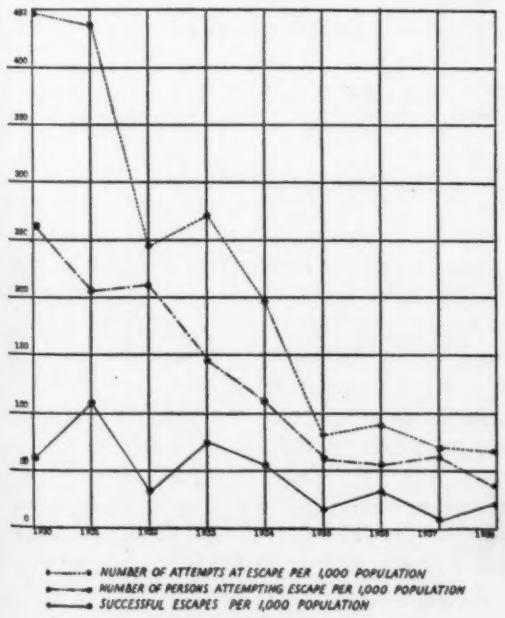
NUMBER OF ATTEMPTS AT ESCAPE PER 1,000 POPULATION
NUMBER OF PERSONS ATTEMPTING ESCAPE PER 1,000 POPULATION
SUCCESSFUL ESCAPES PER 1,000 POPULATION

FIG. 4.—Escape.

calculate the number of attempts and successes in terms of unit population. When this was done the steadily downward course of these rates in our hospital was clearly revealed as shown in the accompanying graphs. Moreover, while it might be theoretically possible to account for part of the shift in suicides on the basis of the national trend, there is no reason to assume that this trend could account for the attempts and successes at escape. The curves plotted on Figs. 2,

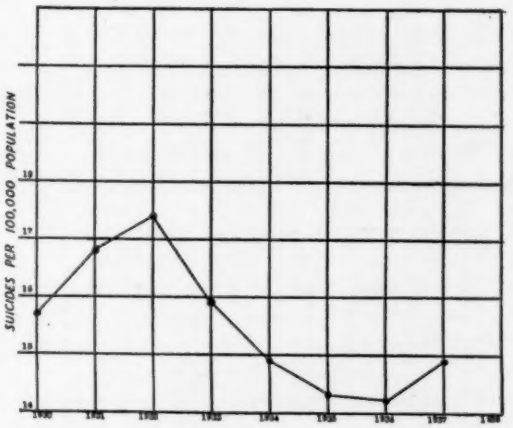

FIG. 5.—Suicide in registration area of United States.

3, and 4 show that the curves for attempts and successes at suicide and escape have the same general shape regardless of whether we plot total numbers of attempts or numbers of persons involved in attempts during these years. This would seem to indicate that as far as our hospital is concerned,

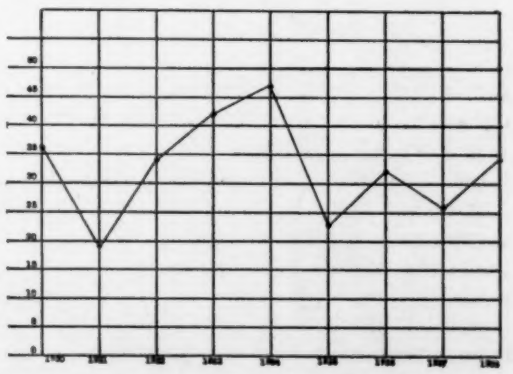

FIG. 6.—Suicides in New York State Hospitals per 100,000 population.

common factors affect both types of emergency.

Not only do our curves fail to conform to that for suicide for the general population in the United States, but a glance at Fig. 6 shows they differ from that for sui-

cides for the New York State hospitals.[2] This indicates that probably our experience is determined by factors more or less independent of general trends in mental hospital populations. Since the curve for the New York State hospitals differs materially from that for the United States as a whole, there is a strong suggestion that the incidence of suicide in hospital populations is determined more by policies regarding the management of the mentally ill than by trends affecting the extra-hospital population.

With an increase of our patient population there went also an increase of physician and nursing personnel. When these increases are compared, it is seen that actually there has been very little difference in the case load for these workers over this period of time (Figs. 7 and 8). Evidently the trends in suicide and escape cannot be attributed to ratio of patients per unit of staff in this instance, particularly if one considers the fact that with increased numbers of personnel there has been necessarily also an increase in the amount of administrative supervision and, with greater complexity of regulation, a very marked increase of the written reports and charts required of the nurses. We do not mean to imply in any way that the problems of suicide and escape are not related to the ratio of personnel to patients. Our contention is that since this ratio has been kept fairly constant in our hospital throughout the period covered by this study, changes in the rate of suicides and escapes cannot be attributed to this factor.

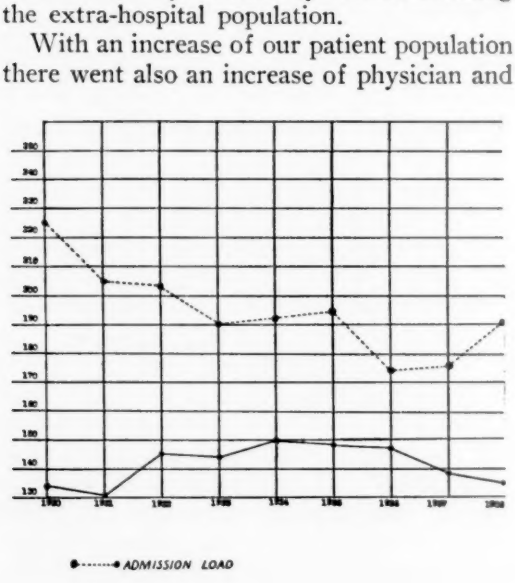

FIG. 7.—Case load and admission load per 100 nurses and attendants.

It might be considered that even if the ratio of personnel to patients were not increased over this period, nevertheless the selected personnel during the better years might be superior to those in the years with the highest records. While it is undeniable that the psychiatric education of both nurses and physicians during their training years has steadily improved over the period of our study, other factors make it unlikely that (aside from increased experience and familiarity with the problems of this hospital), our present staff has talents superior to those of the staff functioning when suicides and escapes were at their peak. In the first place the nuclear organization of superintendents, assistants and supervisors has been fairly constant with relatively few exceptions. As for the physicians, this institution has always filled its vacancies by selecting the best available material from a large number of applicants. It is quite impossible to make a comparative statement excepting to note that those physicians who have accepted positions on our staff and have subsequently left, have for the most part had satisfactory careers. As for nurses and attendants, the depression

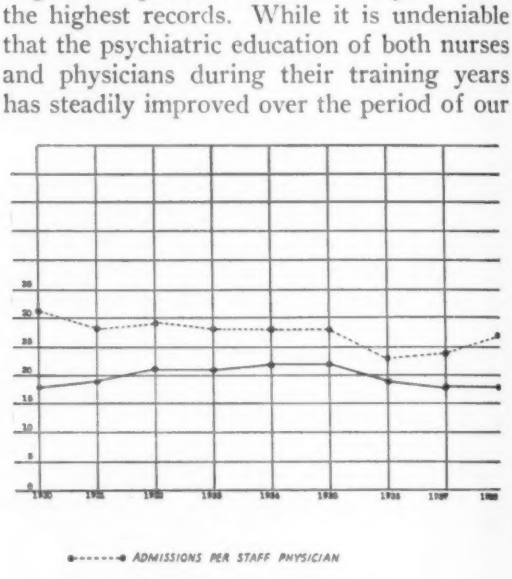

FIG. 8.—Case load and admission load per staff physician.

[2] Personal communication from Dr. Horatio M. Pollack, Albany, N. Y.

years with the curtailment of employment in other places resulted in a marked increase in the numbers of available personnel of superior qualification and training; whereas during the period of recovery, the numbers available have steadily decreased and many of our best nurses and attendants have left us to accept more remunerative or less arduous or superior positions elsewhere. We do not mean to imply that there has been any deterioration of the staff during this time but only to point out that whatever changes have occurred were not of such a striking nature as to account for the shifts in suicide and escape which we are considering.

The curves suggest also that during the period of maximum expansion the problems of suicide and escape were most serious (Fig. 1). This is more or less true, but one finds it difficult on this basis to account for the fact that in 1932 when the population increase was 24 the successful escapes fell to 8, whereas in 1933 with an increase of only 8, the escapes rose to 18 and the successful suicides remained constant during this time. Likewise attempts at suicide in 1931 were 139 per 1000 population with an increase of 25 in the census whereas in 1932 there was a ratio of 166 per 1000 with a census increase of 24 and in 1933 there were 157 per 1000 with an increase of only 8. It seems clear that while the period of maximum expansion presented the difficulties of training new personnel and organizing new units, thereby contributing somewhat to the problems of suicide and escape, it was by no means the most potent factor at work.

It is not necessary to tabulate the detailed statistical material which was painstakingly worked up on the more obvious factors such as age, time of day, time of year, etc. There was nothing in any of this material which would account for the decreasing trend. We can state that attempts at escape occurred at practically every hour of the day and night but with the majority, as would be expected, in the waking hours from 8 a.m. to 6 p.m. This was also true for attempts at suicide which, however, were somewhat more evenly distributed. We did not find peaks at mealtime as noted by some other authors, but rather in the mid-morning and mid-afternoon. The age range of attempted suicides was from 15 to 75 years; of attempted escapes from 15 to 65. The peak of the former was in the fourth decade; of the latter in the third. The actual number of suicides was too small to give a valid distribution curve but the number of successful escapes showed a somewhat higher age range than the number of attempts although the peak fell in the same decade indicating that maturity might play a part in the outcome of the venture. The time in hospital before the first attempt showed the same range for both suicide and escape with the overwhelming majority occurring in the first six months and very few after the first year. Since none of this material sheds any light upon our problem, we shall dismiss it with this brief mention.

One fact of importance, however, does stand out,—almost half of the patients who succeeded in suicide had parole privileges at the time. We have no data that would enable us to determine retrospectively with any accuracy the ratio of parole to non-parole patients during these years. However, we know that during the years in which suicide occurred more frequently, about one fourth of our patients had these privileges whereas at the present time only about one fifth are so situated. This does not seem to be a major factor in the diminution of suicide and escape problems, nevertheless, for the reason that only one of the nine patients succeeding in suicide in the two years 1930 and 1931 was on parole, whereas five of the six patients successfully committing suicide since 1934 have been parole patients. Evidently we are still making the same number and kind of mistakes in judgment as formerly in regard to this matter. Moreover, the attempts at suicide and escape and the successful escapes by no means show preponderance in the parole patients.

We do not wish to pass by this aspect of the problem without a further remark since it may be suggested by some that if all the patients who had evidence of suicidal trends were adequately protected, these tragedies among parole patients would not occur. Parole privileges are never given a patient in this hospital without concurrence of staff opinion. For this reason we are usually aware of risks when they are under-

taken. We feel that it is legitimate to assume certain risks at times if it seems probable that the increased privileges might contribute materially to the early recovery of the patient. Naturally we do not deliberately place on parole any patient who is known to be actively and immediately suicidal. This state of the patient cannot always be determined with accuracy, however, and we do not feel justified in curtailing absolutely the privileges of all patients who exhibit suicidal trends and who might otherwise benefit by parole because of the possibility of occasional errors in judgment. The correction of this defect does not seem to lie in the general curtailment of parole privileges but rather in developing more accurate criteria for determining the immediacy of the danger in the individual instance. In general we feel safer in assuming such risks if the patient has a good contact with a staff physician and is being seen for therapy every day. That this does not constitute an absolute safeguard is attested by the fact that one parole patient who was under intensive therapy and brought dreams daily, to which he apparently associated freely, gave no indication of the deliberate plans which took him a week to execute and resulted in successful suicide. Careful perusal of the detailed notes on this patient reveals no clue that would be useful in a similar instance.

After careful review of all of the available material we were forced to conclude that the difference in incidence of suicide and escape attempts was probably related to changes in our attitudes regarding these problems. Perhaps the most significant change in attitude is revealed by the following. Prior to 1932 it was the custom to place every patient admitted to the hospital upon active suicide and escape observation. Patients' names would accumulate on the lists until they were unwieldy. Then one day the chief of service would go over the list and remove a number of names. Now it is quite apparent that several different patients would not be actively suicidal one day and suddenly safe from suicide the next. In other words, since many of the patients on the active suicide list had ceased to be actively suicidal long before their names were removed, the nurses responsible for supervision of these patients would not take the order for active suicidal observation as seriously as they should. This led the physicians, who felt insecure regarding their patients, to order special nurses for patients whenever they considered suicide a serious probability. Since a special nurse could not logically be required to be responsible for more than one determinedly suicidal patient, a fairly large number of the nursing and attendant personnel were absorbed in this kind of duty. On the other hand, the intelligent patient invariably understood why he was under special nursing care. Not only was he subjected to the extremely irritating situation of never for a moment being alone, but the very presence of the special nurse served as a constant reminder and therefore a constant stimulus toward suicide. Many attempts and one successful suicide occurred among patients having special nurses.

During the years 1932 and 1933 we established a different principle of management. We began with the idea that every mentally ill person may *potentially* be a problem in regard to suicide or escape. Every patient in the hospital is therefore under casual observation for behavior that might point to an impending attempt. Only those patients who present an immediate and active drive toward suicide or escape are placed on active precautions which consist of alert but unobtrusive observation of the patient by all members of the personnel at all times. Special nurses are assigned to individual patients for this duty only when the nursing service feels unable to cope with the problem otherwise.

This shift in attitude has resulted in several gains not the least important of which is that the responsibility for preventing suicides and escapes is placed squarely where it belongs, upon the shoulders of the nursing service which has twenty-four hour a day contact with the problem. There can be no evasion of this responsibility through the plea that no order was left by the physician. Under these circumstances the nurses rise to the occasion very well. With this accomplished, the need for assigning special nurses for such duty is very much diminished. This releases more nurses for general duty and the observation and nursing care of all patients is thereby much improved.

As a part of this change in attitude there has been a better realization of the fact that the *only* effective preventative of suicide is observation of the patients. Hence, we place much less faith than formerly in the removal of obviously potential instruments of suicide from the patients' environment. This does not mean that we fail to act sensibly in this regard. We are all thoroughly aware that a fair proportion of suicides are impulsively carried out when the patient is exposed to the opportunity. Hence we strive to arrange the milieu in such a way that patients who are likely to be so affected are not needlessly exposed to such opportunities. However, we do not place implicit faith in our ability to remove all hazards and recognize that too obvious removal of such instruments may be more effective in prompting the patient toward suicidal attempts than the presence of the hazard itself. We especially feel that restrictions which impose too serious curtailment of comfort upon the patient may accent the suicidal drive by making life unbearable.

Moreover, the patients who exhibit drives toward suicide are most ingenious in devising ways. One has to avoid those attitudes which the patient may accept as a challenge. On the one hand carelessness may lead the patient to feel the need of a demonstration to convince us of the seriousness of his intent; on the other, overconcern may encourage the patient to make a game of outwitting us. We treat every threat of this kind as a serious problem and attempt to meet it with calm confidence, maintaining an attitude which often relieves the patient of anxiety as to his welfare as well as the need to demonstrate. For example, we use metal spoons even on our most disturbed wards. Most of the patients handle them without danger to themselves or others and prefer them to paper utensils. Recently, however, a disturbed patient swallowed a metal spoon in an attempt at self-injury. He developed a perforation of the stomach requiring operation. Following this he appeared considerably improved mentally but at the first opportunity he swallowed another spoon. This one was paper and caused no disturbance. However, we did not think it necessary or advisable to deprive other patients of the metal spoons, and no other patient has followed his example.

This brings up another point of change in attitude. It has always been our desire to keep every patient who is physically able on a program of full activity corresponding more or less to what has recently been dignified by the term "the total push method." For this reason we have been reluctant to curtail the activities of any patient if it could possibly be avoided. This formerly led to many avoidable attempts at escape and suicide. It is really striking to run through the suicide and escape reports during the earlier years of this period. Sometimes individual patients made many essays, which almost always occurred under identical circumstances. Thus, if a patient on the way outdoors attempted to throw himself downstairs on one occasion, he could be counted on to try the same thing at the very next opportunity. If a patient tried to escape through the lower halls on the way to hydrotherapy, then the next time he passed that way he would make another attempt. One afternoon a nurse was playing catch outdoors with an active woman who threw the ball, as if accidentally, beyond the nurse. The latter ran after it and as she stooped to pick up the ball the patient made off. She was quickly caught and returned willingly and without difficulty and was allowed to remain out playing ball. Twenty minutes later she repeated the trick, ran when the nurse's back was turned to recover the ball, and had to be caught and returned to the ward. The trick was repeated a third time a few weeks later.

We have learned to recognize the fact that these attempts tend to be somewhat stereotyped and strive to prevent a patient who has demonstrated susceptibility to a certain constellation of stimuli from being exposed to the same or a similar situation. Where this is not possible we seek to render the dangerous situation innocuous as in the case of the spoon mentioned above.

It is true that some fixed hazards have been removed from the hospital during the period under consideration. Primary among these are: (1) Enclosing all stair wells to which very ill patients are exposed. (2) The use of waste paper baskets with perforated

sides to prevent their use for drowning. (3) The removal of a high partition from one of the bath rooms. (4) Increasing the height of the enclosure for outdoor exercise for disturbed male patients.

These hazards account for only a very small portion of the attempts and successes at suicide and escape, but they were relatively infrequently used compared with many other situations which we cannot correct in such simple fashion. A better safeguard, we have found, is to require all nurses working on a ward to be familiar with all their charges who are likely to precipitate suicide or escape emergencies and to be familiar with the hazards likely to be encountered.

Another significant change in attitude is reflected by the assignment of one or more female nurses to every ward on the male service. Formerly there had been several of the male wards manned entirely by male nurses and attendants, but it was realized that all kinds of accidents to patients tend to diminish on male wards when female personnel is assigned It is possible that the tendency to panic is increased in a purely homosexual environment and that its dilution with even a modicum of heterosexual stimulus may be helpful. On the female wards this is taken care of in part by the staff physicians who make daily rounds. On the male wards, however, only the assignment of female nurses can accomplish this. In this connection it is of interest that during an experiment with chemotherapy in 1938 a ward was set up housing both male and female patients cared for by nurses and attendants of both sexes. Although practically all of these patients were greatly disturbed, some of them presenting serious suicide, homicide and escape problems, there was no serious attempt by any patient on this ward during the year the experiment was carried out.

Along the same line we have liberalized considerably our attitude toward association of the two sexes among the patients at parties, dances, etc. Formerly male and female patients were not permitted to dance together, female nurses, occupational workers and attendants being assigned to dance with the men patients and male personnel with the women patients. We have gradually altered this so that male and female patients are permitted to dance together as long as their conduct is socially acceptable, very much as would be the case at a private party except that continuous dancing of two patients together is tactfully discouraged. Similarly, the parole patients are permitted to associate freely at the dramatic club, the tennis courts, the library and on the front lawn or in any situation which permits of casual supervision, although they are not permitted to make dates with each other or to wander off the campus together.

We believe that we have also added to the security of our patients by more subtle changes in attitude. One of these is an attempt at what we might call "de-sloganization." One notes a tendency to formulate principles of management in epigrammatic form and then to read into them more significance than they warrant and to apply them too uniformly and too extensively. Since 1932 we have striven to interrupt this tendency whenever it is encountered, as well as to avoid it if possible by avoiding the slogan-like statement. Some of the slogans we have had to contend with have been, "Let the patient live out his impulses"; "Sedative medicines are less harmful than loss of sleep"; "Seclusion and restraint of patients is detrimental to their welfare"; etc. All of them contain a considerable element of truth. It is the "sloganizing" of that truth which leads to a loss of perception of its relativity and causes inability to discriminate in its application. For example, "Letting the patient live out her impulses" led one physician to object seriously to interference with a patient who went on a window-breaking rampage. It was also seriously advanced by a young physician as a reason for not interfering with the squandering of her fortune by a wealthy woman patient suffering from manic episodes. By avoiding such slogans, such inappropriate applications are avoided while one need not lose sight of the truth involved. Within the protection of the hospital it is possible to permit patients to live out many of their impulses without damage to themselves or others or too serious damage to property. One also has to consider the example set others, the general ward disturbance, and

consequent discomfort of all as reasons for interrupting too extensive activity.

We encourage the patients and the personnel to look upon the various wards as situations arranged to provide progressively wider degrees of latitude of conduct. But increased freedom requires greater and better supervision if disasters are to be avoided since one cannot permit patients that degree of freedom which inflicts injury upon themselves or others or imposes too much upon other people. Patients on the quieter and less disturbed wards are permitted greater freedom from external control of conduct but necessarily therefore impose upon themselves a correspondingly restricted range of behavior in conformity with what the group can tolerate. The most disturbed wards are looked upon as tolerating conduct which approaches as nearly as is safely possible unlimited freedom. We do not permit nudity, for example, on our better wards but it goes uncriticized on the more disturbed ones. Untidiness of excretory functions requires a milieu in which this will not be too great a burden upon others. If our attitude is properly evaluated, it will be seen that we aim toward the goal of accepting the patient as we find him. In order to do this we must be secure in protecting him and others from injury. Quite extreme conduct can be tolerated in suitable surroundings without harm to anyone. Our security and assurance in this regard add tremendously to the security of the patient, who, unable to control his conduct, finds a situation arranged for him in which it will not lead to untoward denouements nor to our rejection of him.

For this reason we have carried on an energetic campaign among physicians, nurses and attendants to change the attitude toward packs and tubs, ward changes, seclusion and restraint, from the punitive reaction (so often exhibited by the untrained) to an attitude of helpfulness and therapy. Particularly the aggressive connotation of restraint has been replaced by the idea of protection from injury to the self or others which we feel represents something nearer to what we are trying to accomplish.

As part of the program of prevention of suicide and escape, periods of instruction for the nurses are held at regular intervals and the nursing instructors question the ward nurses as to their familiarity with patients who constitute special hazards as well as with means and agents through which such attempts are accomplished. The routine nursing book, with which all nurses are required to be familiar, carries a page in which this information is condensed into a brief summary which can be reviewed easily and concisely. In addition, every successful essay at suicide or escape is gone over in detail in staff conference and ways and means of correcting defects in management are discussed fully. In the nursing department we have established a collection of the various agencies and instruments used in suicidal attempts. This collection is kept on display in the nursing classroom and serves to keep the personnel acutely aware of the major hazards. As a result of this sort of instruction many attempts at suicide and escape are undoubtedly avoided inasmuch as preliminary activities such as picking up a bit of broken glass on the grounds, the secreting of bits of cord or fiber from the occupational therapy department, which might later be twisted into a rope, or the secreting of a piece of metal in the shop, etc., is apt to be detected at once and interrupted so that the ultimate attempt at suicide (toward which this activity is aimed) never materializes. In the same fashion the nurses are not likely unwittingly to lead a patient into a situation of special hazard, such as proximity to the railroad trestle or the bridge across the creek. They are also more apt to be fully alert to the dangers attendant upon conducting actively suicidal patients across or along roads which are used for automobile traffic. The nurses and attendants are coached in ways of carrying out these simple principles unobtrusively and avoiding as far as possible any suggestive behavior which might in itself precipitate an attempt.

In addition to the above topics which have been discussed as reflecting changes in attitude regarding these problems, we, of course, carry out the usual common-sense procedures which should be enforced everywhere, such as observation of the contents of incoming mail when the patient opens it, checking the tools used in occupational therapy and the utensils used in the dining room, checking

scissors and other instruments in and out from the nursing office, the barber shop and the beauty parlor, regulating the possession of belts, bathrobe cords and similar articles, and the awareness as to which patients have in their possession jars of cosmetics, etc., which might furnish instruments for suicidal purposes but toward which our attitude is much more liberal than formerly. It would occupy altogether too much time to enumerate all the details of the procedure but since these methods of observation were enforced throughout the entire period under study, they in themselves do not constitute a basis for the change in rates of suicide and escape accidents.

Summary and Conclusions

We have presented a study of suicide and escape emergencies occurring in the Sheppard and Enoch Pratt Hospital during the nine year period from 1930 to 1938 inclusive. During this period there has been a progressive fall not only in actual suicides and escapes but in the number of attempts as well as the number of persons engaging in those attempts. We find it impossible to attribute this change to either the general trend in the United States during the same period or to statistical data such as age, severity of illness of our patients, or the case load of patients per unit personnel over the period of time studied. A review of this period reveals changes in attitude toward these problems that appear to be more significant and which may be summed up as follows:

1. A recognition that every mentally ill person is a potential suicide or escape hazard.
2. That the best preventive of suicide or escape is a nursing personnel that is acutely aware of the hazards and methods involved.
3. That special precautions against suicide and escape may be so exaggerated as to bring about the attempt through suggestion.
4. A recognition of the fact that much of the discomfort of patients in mental hospitals arises from their sexual tensions in situations rigidly restricted to a homosexual environment. This can be relieved in part by increasing as far as possible the mixed sexuality of the milieu in which the patient finds himself.
5. A recognition that too great restriction of patients' activities for the purpose of preventing suicide or escape may so increase the patient's discomfort as to add to the urgency of his attempts.
6. That the assignment of a special nurse to a patient with a view to preventing suicide or escape is only justifiable when the drive exhibited by the patient is immediately active to a degree that renders this necessary and that such specials should be removed as soon as possible.
7. These attitudes should not interfere in any way with carrying out routine practical measures which remove or prevent the development of special hazards.
8. That the prevention of suicide is after all primarily a nursing problem and should be carried out by the nurses. To meet this responsibility it is necessary for them to have special instruction and grounding in the fundamental principles involved.

A CLINICAL STUDY OF SLEEP DISTURBANCES[1]

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University of Minnesota, Minneapolis

Insomnia is so characteristic of certain personality disorders that its variations are important indicators of a patient's progress. For this reason many psychiatrists attempt to measure and chart the patterns of their patients' sleep as carefully as they chart the temperature and pulse.

Before describing the approach in this study it is desirable to review briefly a few points with reference to the physiology of sleep. It is generally accepted that sleep is a relative state which occurs in various degrees from "deep sleep" to "wide awake." There is considerable variation from person to person and in one individual from time to time, and sleep does not affect all physical and mental functions to the same degree. As a common example: while apparently "asleep" a person can answer questions which he may be unable to recall on awakening.

The physiologist looks upon sleep as a complex function which cannot be directly measured with accuracy. However, there are many physiological functions which are more or less related to sleep and which may be used as partial measures. Though there is considerable individual variation, we find a slowing of the pulse and respiration, a lowering of the blood pressure and body temperature, an increase in electrical skin resistance and changes in the electroencephalogram; but none of these can be used satisfactorily for the clinical measurement of the depth of sleep.

The most useful and practical measures of sleep are dependent upon the motility or amount of movement during sleep. Such a measure was chosen for this study because of the extensive data already available on the sleep motility of normal subjects and because of its relative simplicity.

According to motility studies, the average normal sleeper shows the following pattern: there is a pre-sleep period of settling during which the individual is fairly restless. This period varies from a few minutes to a half hour. During the sleep period proper, though there is considerable individual variation, changes of position or movements of some part of the body occur many times during the night. Kleitman(1) reports the total number of these movements as varying from twenty to sixty per night depending upon the restlessness of the sleeper. Other workers with variations in apparatus and reading methods agree essentially with these figures, though some give higher frequencies of movement (about 70-80). The findings point to the correctness of Laird's(2) statement concerning motility: "Intermittent gross bodily movement is almost as characteristic of sleep as fading consciousness, falling blood pressure . . . . and the loss of voluntary muscle control." Usually one or more quiet periods of thirty minutes or longer occur during the night. Most workers find that the first half of the night is decidedly more quiet than the last half, though Johnson(3, 4) feels that the distribution of the quiet periods is a characteristic of the individual sleeper.

A certain amount of movement during sleep seems desirable for the proper maintenance of circulation and for the avoidance of discomfort or even "sleep paralysis" which can result from the failure to change position. Unpleasant afferent impulses resulting from the prolonged maintenance of one position may cause the sleeper to awaken sufficiently to move to a more comfortable one. In any event a person moves more and more frequently as his sleep becomes lighter until he finally awakens. From motility studies it has been concluded that the deepest and most recuperative sleep is the most motionless. It is certain that shallow sleep with much dreaming is accompanied by marked increase in motility.

[1] Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

Several motility studies have been carried out on psychiatric patients. From these Kleitman(1) concludes: "It would seem that mentally ill patients need not have a different from normal sleep motility pattern except under special conditions of muscular hypo- or hyperactivity." Manic patients have a delayed onset of sleep and a definite increase in the total motility. Stuporous catatonic patients and the very low feeble-minded showed less than normal motility with an even distribution throughout the night.

The basic function of the motilograph (Fig. 1) is to record mechanically the movements of the sleeper by some device attached to the bed. The machine used in this study is a modified Stanley-Tescher(5) "hypnograph" (Stoelting Co.). Dr. Starke Hathaway of our staff made certain improvements such as eliminating noise by the use of an electric drive and by using paraffin kymographic paper instead of ink recording. A leg of the bed is suspended by coiled springs and a stirrup, the movements of which are transmitted to the kymographic paper by a linkage to a stylus. A timing device marks off ten-minute intervals. A metal cover can be locked in place, making the machine relatively tamper-proof and thus safe for use on a psychiatric ward. The apparatus is relatively trouble-free and, if necessary, will run continuously with very little attention.

The record is short enough to be easily handled, six centimeters representing one hour. It shows individual movements clearly up to six per minute. Sensitivity is not great enough to show respiration; but movement of any magnitude, such as moving an extremity, records clearly. Tracings obtained on normal sleepers (recovered patients) are essentially similar to those obtained by other workers when comparable readings are made.

After numerous inspections and measurements on graphs of normal and disturbed sleep, it was concluded that any period in which no more than three movements occurred within a ten-minute interval represented a fair level of rest and very likely restful sleep. The total of such intervals in a night is arbitrarily taken as an indication of the amount of sleep for the purposes of this paper and will be referred to as the hypnograph sleep measure. ("H" in figures.) Of course if a subject moves three times every ten minutes, with no long periods of rest, his level of sleep would not be very good even though the arbitrary sleep measure is normal; this has never occurred to date. On the other hand, the measure does indicate that a person considered as not resting by the hypnograph measure would be moving four or more times per ten minute interval; and this would surely represent a state of very shallow sleep if not one of complete wakefulness.

One hundred selected cases were studied in the University of Minnesota Hospitals, most of them in the psychiatric section. The proportion of patients was as follows: 49 per cent psychoneuroses, 31 per cent depressions (affective psychoses), 10 per cent schizophrenics, and the remaining 10 per cent other diagnoses such as alcoholism, hyperthyroidism and cerebral arteriosclerosis.

The patients were selected because they complained of or demonstrated some degree of insomnia. The ages ranged from 16 to 70, though the vast majority fell between the ages of 20 and 55. The number of nights recorded on individual patients varied from 2 to 32 with an average of nearly 8 nights per patient. The total was 765 nights.

A nurse's sleep graph was kept on every case as a part of the routine hospital procedure. This is the method of charting described by Muncie(6, 7, 8). As the nurse makes her rounds she observes the patient's sleep which she then records on a special sheet (Fig. 2). The result is a sleep chart which shows at a glance not only the amount but also the temporal distribution of the sleep. Some of the more important observations in this study concern the relationship between the motilograms and the nurse's sleep graph.

There are certain objections to the nurse's sleep graph as a method of measuring sleep: (a) The graph is made up from a series of half-hourly observations, but the mode of charting implies that the patient remains as found (asleep or awake) until the next observation. Actually there is no indication as to what occurs between observations. (b) The nurse is required to make a clean-cut decision as to whether the patient is asleep

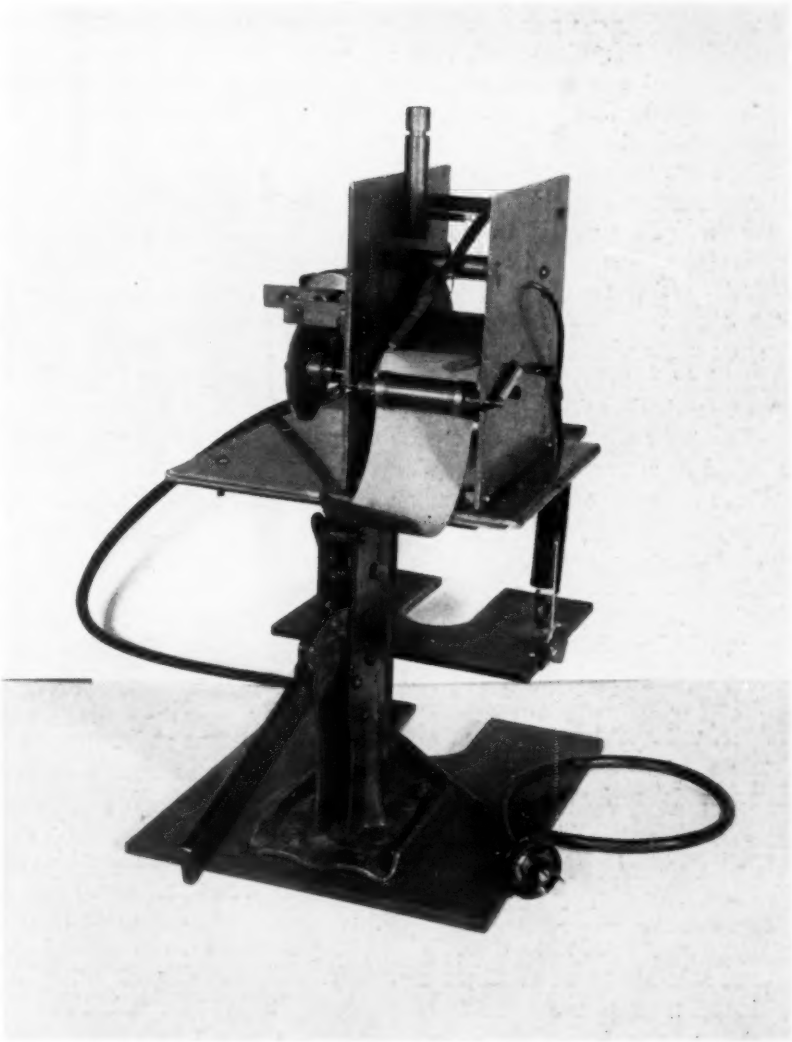

FIG. 1.—The motilograph.

or awake, a point which may be very difficult to determine under some conditions. Certainly if the patient is definitely asleep or awake for fairly long periods, the graph will so indicate. On the other hand, if the patient is very restless, dozing and awaking frequently, or if his sleep is shallow and unnatural, the sleep graph may then not represent the true state of affairs. These objections are illustrated by the following two cases in which the motilograms are used as a supplementary measure to the sleep charts.

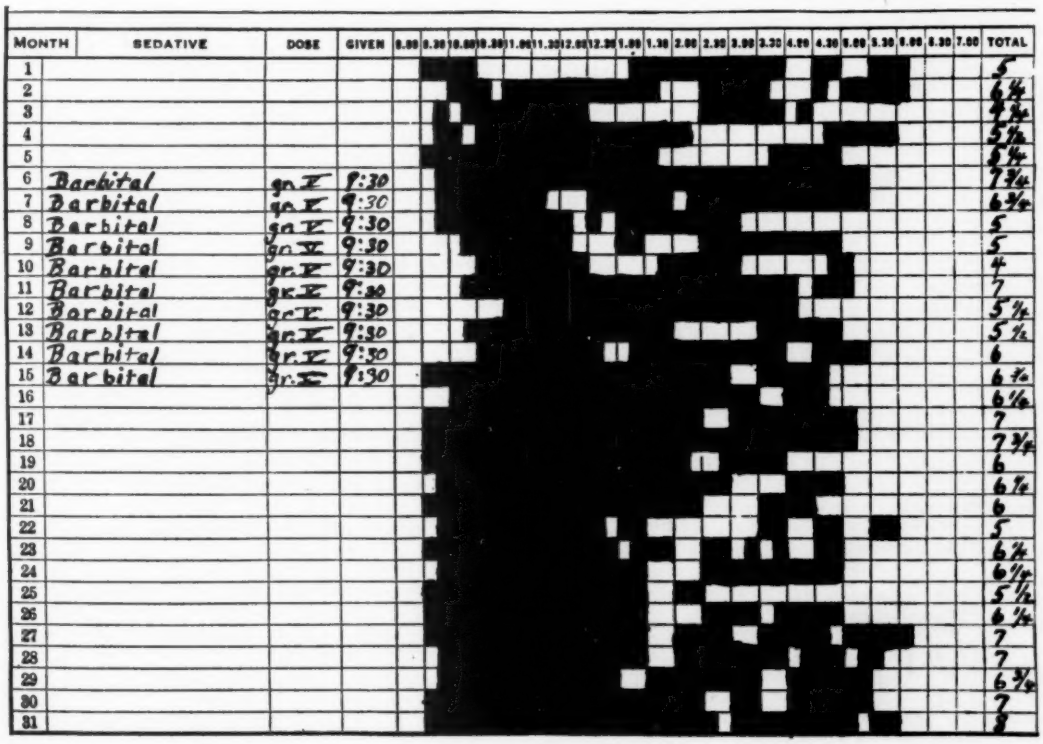

FIG. 2.—Nurse's sleep graph.

CASE I.—A depressed woman of 32 who continually complained that she did not sleep at all. On questioning she would reluctantly admit that she may have slept a little but that it was certainly not a natural and satisfying sleep. The nurses reported that it was difficult to tell whether the patient was asleep or awake since she was generally found lying quietly. Though the nurse's sleep graph indicated only two to three hours sleep each night, the patient did not appear to suffer any ill effects from this insomnia. According to the motilogram, she obtained six to seven hours of rest nightly. In the typical sample, shown in Fig. 3, the sleep was six hours by the motility measure; two hours by the nurse's sleep graph.

CASE II.—The patient was a tense, restless man of 60 suffering with hyperthyroidism, who complained bitterly of his insomnia. He admitted dozing intermittently during the night illustrated (Fig. 4). The hypnograph recorded four hours, ten minutes of sleep, and the nurse's graph showed four and a half hours. Although these totals are about equal, the nurse's report of sleep periods does not correspond very closely with the quiet periods on the motilogram. In this case the motilogram is a much more useful record, since the restlessness may receive over- or underemphasis if the patient is observed only momentarily at half-hour intervals.

For further comparison of nurse's record and motilogram, a correlation coefficient was obtained on a sample of the first night from each of the 100 cases. Fig. 5 shows the scattergram for this correlation which was $.41 \pm .056$. This would indicate that hypnograph sleep could be predicted from the nurse's sleep graph (or vice versa) only one time in ten. Because of this discrepancy these two kinds of records cannot be considered as equivalent. Though the nurse's

sleep graph is a less accurate measure than we had originally thought, we still feel that it is of practical value as a measure of sleep on a clinical service. This is especially true when its limitations are kept in mind and when there are supplementary notes or comments regarding the patient's condition.

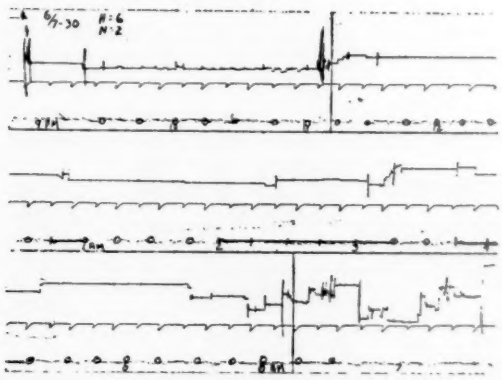

FIG. 3.—Case I. Sample motilogram. H = Total sleep according to the motilograph (hypnograph). N = Total sleep according to nurse's graph. The latter is indicated graphically below the time line, the O indicating the patient found awake; + indicating the patient found asleep.

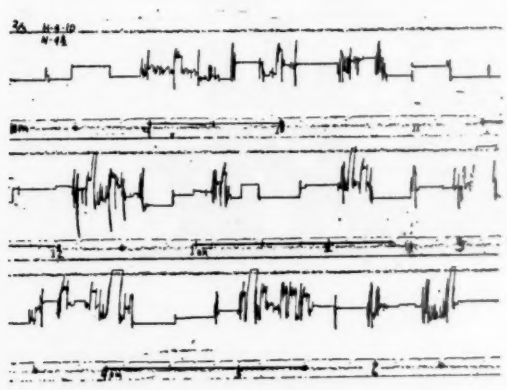

FIG. 4.—Case II. Sample motilogram. The key to symbols is the same as in Fig. 3.

When however it is important to know how much the subject really relaxes during the night, begging the somewhat academic question as to whether or not he is actually asleep, the motility record is a much better measure since it is continuous for the whole period and very accurately times and indicates the magnitude of both short and long restless periods.

We have found the motilograph useful as a direct therapeutic measure and also as a guide to therapy and management as illustrated in the following two cases. It is well known that many patients are fearful that loss of sleep will be harmful. Such patients

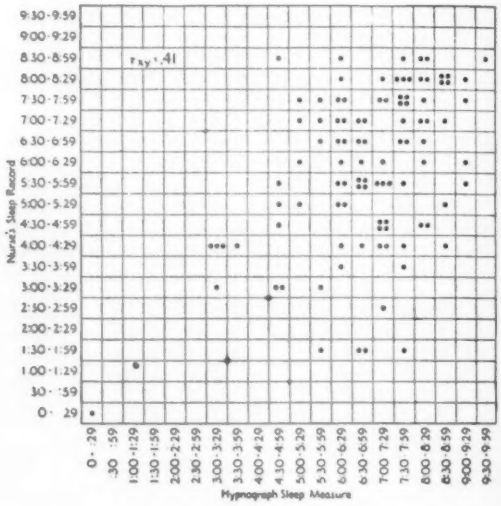

FIG. 5.—Correlation between nurses' records and motilograms on 100 cases (one night each).

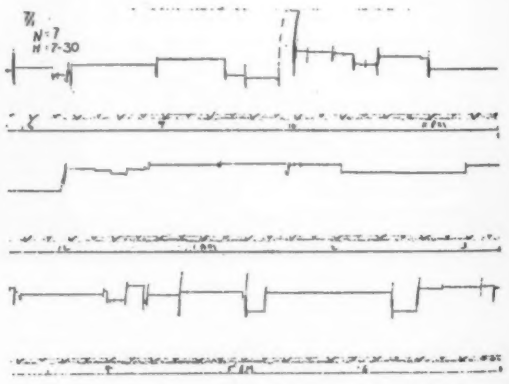

FIG. 6.—Case III. Sample motilogram. The key to symbols is the same as in Fig. 3.

are considerably relieved when it is incontrovertably demonstrated to them that they do obtain adequate rest.

CASE III.—The patient was a professional man who had complained of insomnia for many years. He was certain that his sleep was very inadequate and that his mental breakdown was imminent. During the sample night shown (Fig. 6), he insisted that he had only napped at brief intervals and that he had tossed around in bed "all night." The hypno-

graph sleep was seven hours and thiry minutes with several long rest periods. The patient was very impressed by his motility records and readily admitted that his subjective impression was deceptive; his anxiety was materially reduced.

The following case illustrates the effect of drugs on the motilogram; this phase of

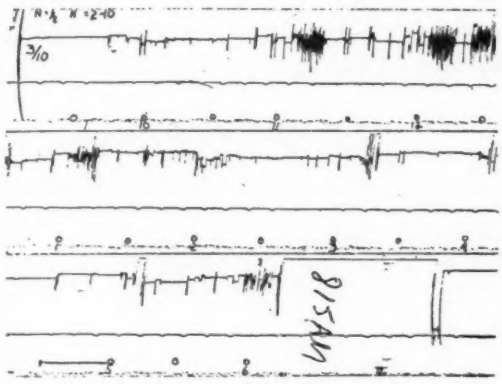

FIG. 7.—Case IV. Sample motilogram. Without sedative. The key to the symbols is the same as in Fig. 3.

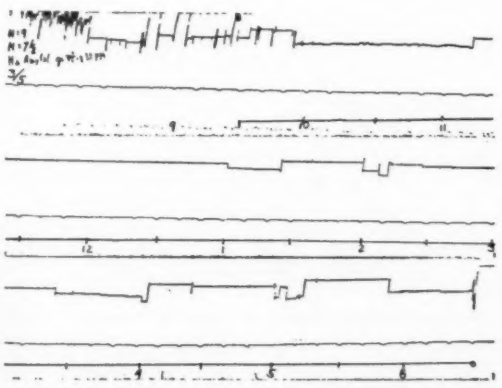

FIG. 8.—Case IV. Sample motilogram. With sedative. The key to symbols is the same as in Fig. 3.

the problem is in process of more elaborate study.

CASE IV.—The patient was a severely agitated and depressed woman of 36. On a night without sedation (Fig. 7) the nurse's graph indicated one-half hour of sleep, the motilogram two hours. Little effect had been obtained previously from ordinary doses of sedatives, but with larger dosage excellent sedation was obtained (Fig. 8).

CONCLUSIONS

The motilograph is an especially valuable measure of physiological rest if not of sleep. Comparisons of motility records with nurses' sleep charts have emphasized some of the objections that may be raised to the latter as an adequate picture of the patient's sleep, although they are the best routine measure available.

A sharp distinction must be made, however, between motilogram measures and the nurse's sleep graph, as the two are poorly correlated and in many patients give widely different pictures. For purposes of scientific investigation of the sleep of patients, the motilogram or some other objective measure is greatly to be preferred.

In any psychiatric ward the motilograph will be found useful as a special adjunct to therapeutic management and as a measure of the patient's progress.

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A DIFFERENTIAL-DIAGNOSTIC METHOD OF INTERPRETING MOSAICS AND COLORED BLOCK DESIGNS[1]

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New York City

The purpose of this paper is to describe a way of analyzing and interpreting certain spontaneous productions of patients from a diagnostic point of view. The subject is asked to select from a box of colored wooden pieces any shapes and colors he likes. He is given a tray on which to make any kind of design he wishes.[2] We have used a set of pieces devised by Margaret Lowenfeld of London and various experimental sets of our own. The productions of the subject are recorded on paper.

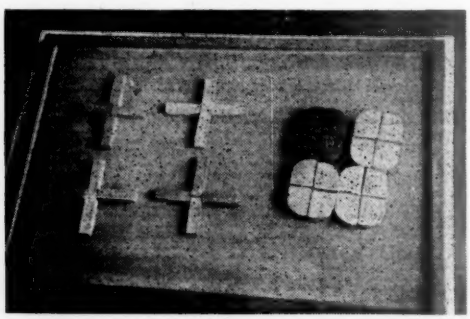

Fig. 1.—Photograph showing wooden pieces on tray as placed by patient. Compare Fig. 3 which is the protocol of this design.

Our differential-diagnostic criteria were reached from a varied and clinically well-studied material of over 1,000 cases including adults and children, normals, psychotics, neurotics, criminals, etc. The patients made a number of mosaics over a period of time and with different sets. The mosaics were interpreted blindly, without previous knowledge of the clinical diagnosis. Later the interpretation of the mosaic and the psychiatric diagnoses were compared and correlated and on this basis the following diagnostic method was evolved.

Normal Subjects

Normal individuals use relatively many pieces, including different shapes and different colors. Their designs are full, harmonious in color and distinct in configuration.

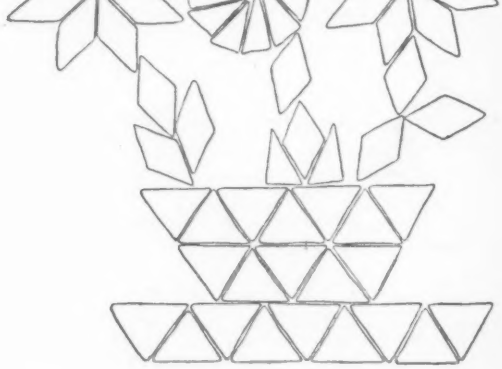

Fig. 2.—Normal control. Female. 21 years. Good representation of concrete object: "Flower pot." Many stones. Harmonious color scheme. Left flower and flower-pot red; center flower yellow; right flower blue; stems, leaves and dish under pot, green.

They are either "concrete," *i. e.*, representing a definite object (Fig. 2) or "abstract." Psychotic patients use fewer pieces than do normal controls.

Schizophrenia

In schizophrenia there is an over-emphasis on formal principles of organization, such as symmetry and repetition. The designs are often simple, but there is an exaggerated and rigid symmetry in both form and color.

[1] Work done under a grant from Child Neurology Research (Friedsam Foundation) at the Mental Hygiene Clinics of Bellevue Hospital and Queens General Hospital. A demonstration of colored records of typical mosaics and their interpretation was given at the meeting of the American Neurological Association (see Transactions, 1939, 65th meeting, p. 188).

[2] See photograph (Fig. 1).

Symmetry is a constructive factor in any good design. But in schizophrenia this principle emancipates itself and stands out in contrast to the meagerness or even emptiness of the design as a whole. It is a formalistic, external symmetry. One can speak of this as "super-symmetry." Often symmetry and repetition amount to stereotypy. Super-symmetry has the more diagnostic significance, the more inadequate and the emptier the design is otherwise (Fig. 3). The designs are usually "abstract," that is, not representing a definite object.

Sometimes schizophrenics do attempt to make a concrete object, but the relationship of the design to the object is apt to be unrealistic and vague. An exaggerated tendency to formal schematization is characteristic; for example, a simple symmetrical house done entirely in black and white.

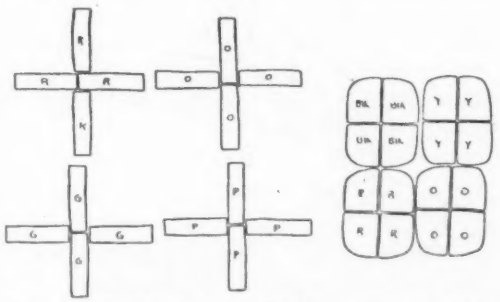

FIG. 3.—Schizophrenia. Male. 34 years. Monotonous stereotyped repetition of very simple design. Only one shape used in each group. R is red, G is green, O orange, P purple, Blk black, Y is yellow.

Schizophrenics usually do not use color realistically. Except as an element of symmetry, it is often disregarded and used indiscriminately. On the whole, schizophrenic and schizoid patients tend to use form more than color in constructing their designs. This is in keeping with findings in experimental type psychology.[3]

Advanced and deteriorated cases of schizophrenia sometimes make scattered, incoherent jumbles composed of isolated pieces or stones, as the mosaic pieces are also called. They contain only rudiments of organization, such as two stones of the same shape or color placed together.

[3] Wertham, Frederic: Experimental type psychology. Archives of Neurology and Psychiatry, 24: 605, 1930.

In cases of remission, spontaneous and following insulin or metrazol treatment, the designs frequently indicate that despite the superficial disappearance of conspicuous clinical symptoms, the schizophrenic process is still clearly demonstrable by the interpretation of these mosaics.

Paraphrenic-Paranoid Type

There is a pattern which is characteristic of severe, undifferentiated, functional psychosis without the formal elements of schizophrenic or manic-depressive stamp. It occurs only in psychotic patients and never in a healthy person. Such a design shows at a glance that a serious psychotic condition is present. It is a simple, compact "agglutination" of a few pieces (Fig. 4). It shows no discernible organization either of form or of color.

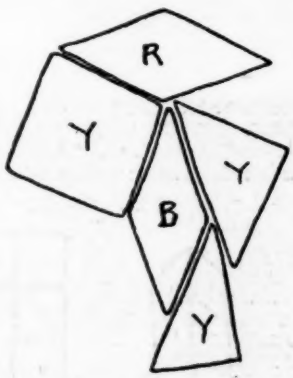

FIG. 4.—Paraphrenia. Female. 42 years. Simple agglutination of pieces. Disregard of color and principles of organization. B is blue.

In cases of simple schizophrenia of post-adolescent age, which present a difficult clinical diagnostic problem, the patients often make such simple agglutinations. This clinches the diagnosis of the existence of a severe psychotic process as opposed to reactive or psychopathic states or behavior disorders with inferior intelligence.

Manic-depressive Psychosis

MANIC STATES

Manic patients tend to use massed and jutting red pieces (Fig. 5). Their designs are relatively simple and like other psychotics they use fewer pieces than do normal con-

trols. The emphasis of the design is on color rather than on form.

Normal designs usually contain some red, unless the realistic representation of an object excludes it. In general, conspicuous use of red indicates excitation or stimulation in the emotional or sexual sphere.

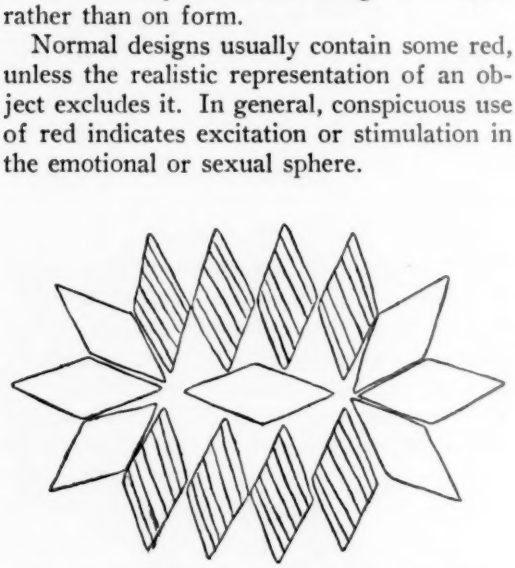

FIG. 5.—Manic-depressive psychosis. Female. 44 years. Manic excitement. Conspicuous jutting red stones. Only one shape used. Shaded pieces are red; midline pieces yellow; others blue.

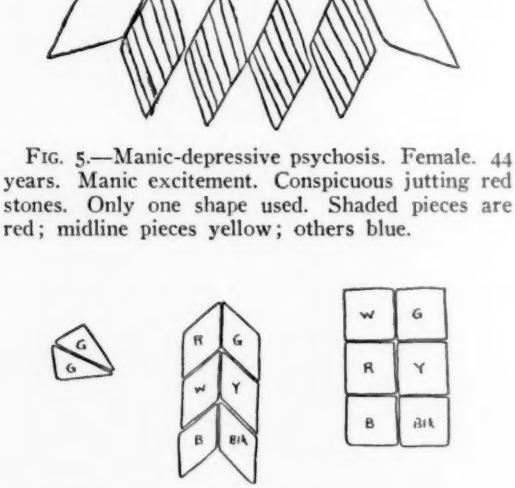

FIG. 6.—Mental deficiency. Female. 22 years. Only one shape used in each design. Enumerative color scheme. Patterns of mental defectives. W is white.

DEPRESSIVE STATES

Patients with severe depression find it hard to muster enough concentration and initiative for this type of self-expression. They may not be able to achieve a single simple design.

As a rule, black—and, interchangeably, dark blue—indicates subdued and depressive moods. This is true only when other colors are also used in the design. Designs which contain only black and white denote lack of interest in color and are characteristic of the schizoid mentality.

MENTAL DEFICIENCY

Mental defectives usually make a number of very small, simple, compact and completed designs (Fig. 6). Each small design is made up of pieces of only one shape. The color scheme is usually enumerative, with one piece of each available color. In Fig. 6 the lower left design and the two on the upper right are especially typical. These same patterns recur time and time again in mental defective cases.

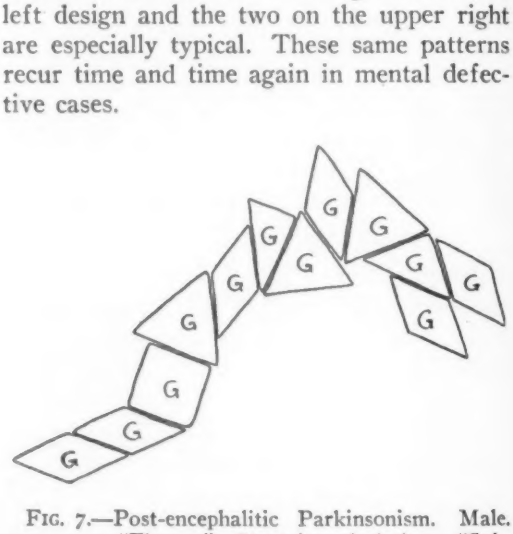

FIG. 7.—Post-encephalitic Parkinsonism. Male. 22 years. "Flower." Stone-bound design. "Sub-cortical" pattern. Position of each stone influenced by the preceding piece, causing loss of original goal of design. Monotony of color. All pieces are green.

On the lowest levels of mental deficiency, patients cannot achieve even these elementary patterns.

ORGANIC BRAIN DISEASE

Whereas in the designs of mental defectives there is good organization at a low intellectual level, in organic brain disease there is a *dis*order in the organization of the designs.

THE "SUB-CORTICAL" PATTERN

There is a typical response which occurs in its pure form in sub-cortical disorders. In constructing his design, the patient is influenced by the shape of each individual piece (Fig. 7). There is a fixation on a piece once it is put down. This tendency becomes so strong that it dominates the

direction and arrangement of the entire design, and disturbs its configuration. Coupled with this there may be a monotony in color (fixation on the color of the piece put down). The term "stone-bound" is suggested for this characteristic pattern. At the expense of an inner plan, the patient follows the impetus inherent in the shapes and colors of the individual stones, so that the whole response becomes reduced to a more mechanical or automatic level. This is a practically useful diagnostic sign of organic brain disease.[4]

Theoretically, the demonstration of stone-bound designs is a confirmation of Goldstein's theory of the "bondage to stimuli" (Reizgebundenheit)[5] exhibited by the organism with impaired brain function. In the normal brain there is a plastic utilization of inner and outer stimuli. The patient with an organic brain disease becomes excessively dependent on outer stimuli at the expense of his inner goal. This can be clearly demonstrated if one follows the successive utilization of the new stimulus of each new piece as the patient makes the "stone-bound" design.

ORGANIC PSYCHOSES: THE "CORTICAL PATTERN"

Patients with dementia use few pieces, make very simple designs and attempt to represent elementary, concrete forms such as a circle, a cross or a star—forms which are preferable geometric. They use color indiscriminately and choose shapes inappropriate for their goal. Failure to achieve a good configuration of even these simple patterns is characteristic. For example, a demented patient attempted to make a cross but failed to achieve the desired configuration because he used five pieces instead of four.

The outstanding features of mosaics made by patients with cortical defect is an inability to achieve a good configuration. There is a dissolution and dismemberment of the Gestalt. Fig. 8 illustrates this in a case of dementia paralytica and Fig. 9 shows it in a child with traumatic encephalopathy following skull fracture.

Patients with senile dementia, severe cerebral arteriosclerosis or Korsakoff psychosis all make very similar designs, characterized by this "cortical" pattern.

Often patients with dementia make a number of very small and incomplete designs, some of which are fragments of the designs typical for mental defectives. In the most advanced conditions of dementia only a few scattered pieces are placed on the board.

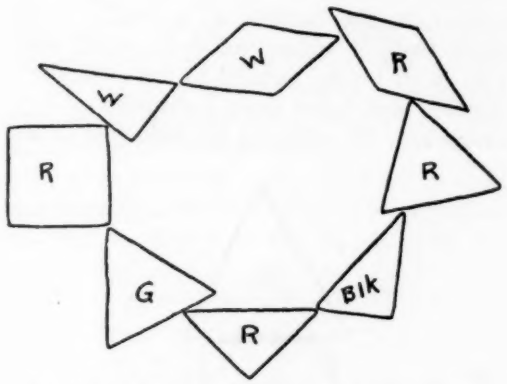

FIG. 8.—Dementia paralytica. Male. 43 years. Organic psychosis. Cortical pattern. Failure to achieve the simple Gestalt of a circle.

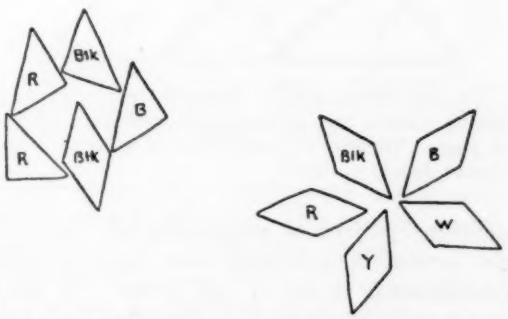

FIG. 9.—Traumatic encephalopathy following skull fracture. Female. 10 years. Left design; failure to achieve Gestalt of a circle. Right design: incomplete configuration of a star.

Fig. 10 is a design made by a patient with dementia paralytica in remission after treatment with malaria and tryparsamide. He barely realized the Gestalt of a "house" on the simplest level. The primitiveness of the design indicates the general organic reduction.

[4] Wertham, F.: A new sign of organic brain disease. Transactions of the American Neurological Association, 65th Annual Meeting, 1939.

[5] Goldstein, K.: Zur Theorie der Funktion des Nervensystems. Arch. f. Psychiatr., 74: 370, 1925; see also Goldstein, K.: The Organism. New York, 1939.

Disorders of Consciousness

Patients with delirium make designs that show no order nor organization and do not achieve any meaningful configuration, although they may make a definite effort.

In epileptic twilight states the patients make peculiar, weird designs. In contrast to delirious conditions, where the designs are incoherent, the designs of patients in epileptic twilight states are well coordinated. This is strikingly parallel to the clinical behavior: both types show a disorder of consciousness; but whereas the behavior of the

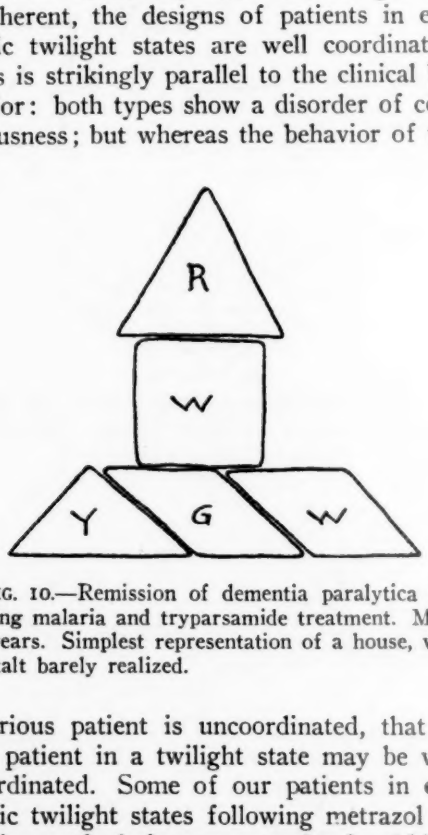

Fig. 10.—Remission of dementia paralytica following malaria and tryparsamide treatment. Male. 40 years. Simplest representation of a house, with Gestalt barely realized.

delirious patient is uncoordinated, that of the patient in a twilight state may be well coordinated. Some of our patients in epileptic twilight states following metrazol injection made designs composed only of black pieces. We cannot explain this strange and striking color preference.

Simulation and Deception

Patients who consciously simulate mental symptoms make revealing designs. Despite the use of many shapes and colors, they fail even to indicate the intended object and the final result is a general jumble. The designs are so inconsistent and meaningless that they could be genuine only in a patient with the most severe type of intellectual deterioration or profound confusion. The protocol of the verbal utterances of the patient, which is kept in all cases in conjunction with the designs, may also indicate deception.

Epilepsy

Designs made by patients with epilepsy do not show any uniform style, although they are not healthy designs. Epileptic patients make a number of small, simple patterns, which may be similar to those made by mental defectives although psychometric tests in the individual epileptic case may show average intelligence. Sometimes the designs show a "sub-cortical" pattern ("stone-bound" designs). In some cases the insecurity, fear and anxiety of the epileptic mentality is shown by the placing of the designs close to the edges of the tray.

This clinging to the edges of the board and avoidance of the open area of the central space is found in many different clinical conditions in which anxiety is present.

Other Conditions

Designs made by psychopathic personalities and by neurotics approach the normal in the number of pieces used, although in severe neuroses the number may be considerably reduced. The interpretation of the designs made by individuals with these personality disorders is less clear-cut than what has been outlined so far and requires a great deal of experience.

Hypomanic personalities use a great deal of conspicuous red in designs that are otherwise as full and well-organized as those made by normal controls. The most aggressive use of red in our whole series occurred in an impulsive psychopathic murderer.

Schizoid personalities may show the characteristics of the schizophrenic pattern, but in very attenuated form and in larger designs. The productions may be as a whole clear, expressive and satisfying, but they show rigidity, monotony, repetition or exaggerated stylization and preponderance of form over color.

The designs made by psychopathic personalities with pathological lying (pseudologia phantastica) do not reflect the superficial productivity shown in their fabrications. They show the underlying psychopathic inadequacy on the basis of which the pseudologia has developed.

An outstanding feature in some cases of psychoneurosis and in catathymic crisis is a disharmony or discrepancy within the de-

sign itself, a counterpart of the emotional conflict within the personality.

Designs which cling to the margin or which take the form of frames occur often in neurotics, especially in cases with fear and anxiety. Neurotics sometimes make a small design surrounded by the design which makes a frame for it. These frames indicate a safety measure to counteract a feeling of inner weakness or conflict.

Depressive elements in neuroses are reflected in preponderance of black and dark blue. None of these isolated features can be interpreted by themselves, however; they must be interpreted in their relationship to the design as a whole.

The Metamorphosis from Child to Adult

The differential-diagnostic criteria that have been discussed apply both to adults and to children, but there are significant differences between designs made by children and those made by adults. This is a method that can be used to demonstrate psychological signs of "the metamorphosis which takes place between childhood and maturity." [6]

Children display a greater facility in depicting "concrete" objects than the average adult does. They can achieve a satisfying configuration with a minimum of means (Fig. 11). A young child may disregard the literalness of the shapes and use them freely to represent objects which they hardly resemble. For instance, an eight-year old boy made a bicycle with the wheels represented by square blocks. An adult would find it difficult to use a square piece to represent a round wheel.

Children may approach the representation of an object expressionistically. One child of five, for example, indicated ingeniously the idea of the moving parts of a motor and called the design "a piece of machinery."

Children are apt to attempt representation of objects which would seem difficult or impossible. They may use color as a scheme of ornamentation. Even when making a concrete object they are likely to use color decoratively rather than realistically. Adults use such decorative color schemes only in abstract designs.

Children have a tendency to dramatize and animate their designs. They make a "house," point to an individual stone in it and say: "This is papa's room." Then they add a black triangle and say: "This is the smoke coming out of the chimney." Designs that indicate movement may be called "dynamic," in contrast to static designs. Younger children may make very simple designs and use them as starting-points for phantasies, with one single design becoming the nucleus of elaborate stories.

Another tendency more frequent in children than in adults is to see the empty space enclosed by pieces as the figure, with the pieces themselves forming the background. For instance, when he places four diamond-shaped pieces together to form a circle, what he may see is the "star" Gestalt formed by the space encircled by the pieces.

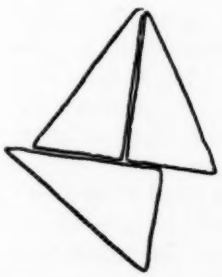

Fig. 11.—Child. 8 years. Male. "Sailboat." Concrete object ingeniously depicted with a minimum of means. All the pieces are white.

The relation of the figure to the background, of the pieces to the tray, is the essential principle of orientation in all mosaics. Developmental studies show the initial significance of the background. The normal response of a three-year-old child is to distribute the pieces over the entire area of the tray, and thus make an "all-over pattern." At this stage, this is the only principle of organization discernible. This tendency may also occur in adults, but frequently in abnormal conditions; it represents a primitive factor.

This compulsion to fill all available space and to make an "all-over pattern" covering the whole background has a parallel in the history of art. The ornaments on Greek vases in the primitive dipylon stage at about

[6] Wertham, Frederic: Eidetic phenomena and psychopathology. Arch. of Neur. and Psychiat., 24: 809, 1930.

900 B.C. covered all the surface; in the later classical periods black or red figures stood out clearly against the uniform background of the vase.

Practical Uses

These designs provide a useful diagnostic aid in neuropsychiatry. They can be done very quickly, they are independent of language, they give a quick clue in many cases of doubtful diagnosis and they provide a permanent record of the exact response of the patient. They permit the recording of changes that take place during a course of treatment that runs over a long period, as for example in schizophrenia. Sometimes they indicate at a glance the existence of a psychosis or organic brain disease when the clinical impression had pointed to more superficial and less serious abnormalities. In obsessive-compulsive states they may reveal at once whether the condition is on a schizoid basis (with a poor prognosis) or an affective basis (with a good prognosis). In diseases with questionable neurological symptoms they may point immediately to an organic basis.

The designs also provide a realistic indication of the functioning level of intelligence. They are a valuable adjunct to quantitative tests. Not every difference in intellectual functioning is expressible in terms of a little more or less: an I. Q. or a mental age which is higher or lower. At certain nodal points there is a qualitative change in organization of the use of intellectual resources. In many cases where psychometric tests indicate various degrees of borderline intelligence, these designs show plainly whether the individual *functions* at a mental-defective level or not.

In some instances the mosaics are useful only in conjunction with other data. For example, some adult patients make a number of very small designs similar to those typical of mental defectives although on psychometric tests they make very high scores. Such a discrepancy points invariably to a severe psychosis.

As an aid to diagnosis, this method deserves a place in the armamentarium of the psychiatrist in practice and in research. If an evasive patient, to cite one instance, whose objective past history is not available makes a design which is a primitive agglutination of wooden pieces of assorted colors (*cf.* Fig. 4), a quick diagnosis of severe psychosis can be safely made.

This method has considerable theoretical interest as well. For example it throws light on the psychology of schizophrenia. The designs show that in schizophrenia two tendencies which should form a unity are no longer properly integrated: the tendency to expression of content, and the tendency to formal organization. There is an ascendancy or an emancipation of the formal tendency which is expressed for example in "supersymmetry." The result is a dissociation between content and form.

The "stone-bound" designs afford an example of the use of this method for investigations in brain pathology.

Method of Procedure

For practical application of this method, the following procedure is suggested. If confronted with the mosaic of a patient, one determines the following characteristics:

1. Number of designs (one large one or several small ones).
2. Coherence or incoherence of design.
3. Representation of a definite "concrete" object or "abstract" design.
4. Harmony of the design as a whole.
5. Completion or incompleteness of design.
6. Meaningfulness or emptiness of design.
7. Simple or complex design.
8. Compactness or looseness of design.
9. Distinctness of configuration.
10. Relation of design to object (realistic or schematic).
11. "Static" or "dynamic" (indicating movement).
12. Expression of configuration by the pieces or by the empty space they enclose.
13. Position of design within the frame of the tray (*e. g.*, relation to margin, general distribution, "all-over pattern," etc.).
14. Number of pieces used.
15. Choice of color (preferences, indiscriminate, harmonious, indicating natural colors of object, decorative ornamentation of a "concrete" object, etc.).
16. Choice of shapes (only one or several).
17. Emphasis on form or color.
18. Simple geometric design.
19. Appropriate choice of shapes for intended representation.
20. Evidence of fixation in form or color on individual piece put down ("stone-bound" design).

21. Symmetry (absent, present, in color or form or both, exaggerated, etc.).
22. Repetition; stereotypy.
23. Relation of design to what the subject says.

With the use of such a scheme an objective description of the mosaic can be obtained which can be readily correlated with the differential-diagnostic criteria outlined in this paper.

The interpretation of mosaics according to this method offers an avenue for study of psychopathological conditions in children and adults. It should be used in conjunction with psychiatric and neurological examinations and psychometric tests. Over the Rorschach test it has the advantage of wider diagnostic range and greater objectivity, simplicity and speed.

OBSERVATIONS ON PSYCHIATRIC SEQUELAE TO SURGICAL OPERATIONS IN WOMEN[1]

By ERICH LINDEMANN, M. D., Ph. D., Boston, Mass.

Introduction

Careful studies are already available about the type of psychiatric conditions found after surgical operations (Abeles(1), Amreich(2), Aschner(3), Cobb(4), Ebaugh(5), Ewalt (6), Miller(7), Preu(8), Washburne(9), Wengraf (10)). A new consideration of this subject has to be justified by a new approach. Although we know a good deal about the more dramatic psychiatric conditions which follow an operation immediately, not so much is known about the minor variations in behavior which may ensue later, and the knowledge obtained from *post hoc* observations has not so far led to reliable information upon which to base a preoperative psychiatric prognosis. It seemed advisable to make observations in patients before the operation, and to chose patients who did not present special psychiatric problems but represented the ordinary type of surgical patient. By learning to identify patients with liability to untoward psychiatric reactions we may be of assistance to the surgeon.

For some time "traumatic experiences" have been alleged to be responsible for a variety of abnormal psychiatric conditions. Their relative importance and the degree to which they actually damage the individual can often be inferred only vaguely. Surgical operations present a well-defined trauma consisting of anesthesia, mechanical injury, possible removal of certain organs, and alteration of physiological function set up by the injury. All these seem to leave no obvious mark in the majority of patients, but in some we find a psychiatric condition which suggests that the operation was a "traumatic experience," in the psychological meaning of the word.

At the Massachusetts General Hospital, candidates for major operations are examined psychiatrically whenever their emotional state seems to indicate the possibility of an untoward reaction. Cobb (1938) has described a number of postoperative psychoses observed at this hospital and has pointed out that the symptom picture of such conditions is not so much that of an acute delirium with confusion and disorientation but rather that of a vague alteration in perception and mood such as is often seen in the so-called symptomatic psychoses with pernicious anemia or in puerperal states. It is probable that these reactions are related to the metabolic changes and to the gross alterations in autonomic functions which occur at the time of operation, as avitaminosis, toxic factors, tissue destruction and vasomotor effects. In the present study[2] we shall concern ourselves with certain conditions which come on later, as the result of the changes which have taken place in the body, when the patient has left the hospital and is facing readjustment in social and emotional relationships.

Procedure

Our procedure differed somewhat from preceding studies, in which patients with serious disorders who came to the attention of the psychiatrist were described and where the events surrounding the operation were reconstructed in retrospect. In our own investigation, we tried rather to become acquainted with patients before the operation to assay the amount of anxiety and attending upset of the autonomic system, and in a follow-up study after six months or a year to obtain mental status and psychiatric

[1] Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

From the Psychiatric Service of the Massachusetts General Hospital and the Department of Nervous and Mental Diseases, Harvard Medical School.

[2] The findings to be presented here have been collected as an aspect of a more comprehensive study in progress in which Dr. S. Cobb, Dr. J. Stewart and the author are trying to find information concerning the relationship of collapse and shock reactions immediately after the operation to preoperative anxiety and to autonomic abnormality.

history from the patients so observed. In doing so, we hoped to discover, first, whether the amount of anxiety before the operation has anything to do with the psychiatric postoperative course; second, whether patients appear in this group who ordinarily would not come to the psychiatric clinic, but who carry their misery at home or see their home doctor, being reluctant to seek the advice of a psychiatrist for fear of being hospitalized; and finally, whether we would discover psychiatric symptom combinations characteristic for this group which would permit conclusions about other postoperative patients whom we meet in the psychiatric clinic.

It seemed wise to restrict ourselves to a fairly homogeneous group of individuals at the outset. Therefore we chose a series of women not younger than 20 and not older than 55 who had had abdominal operations either in the upper abdominal cavity or in the pelvic region, who had no psychiatric complaints at the time of the operation, and who had no discoverable disease of the central nervous system or of the autonomic system. We also excluded all patients who had any postoperative somatic complications and selected only those who had an uneventful convalescence and who were well after the operation, so far as their preoperative complaint was concerned. The operative procedure was the standard one used in the surgical department of the Massachusetts General Hospital. The anesthesia was uniform and was controlled according to the rigid standards of the surgical department. A record of the behavior of the vascular system during the anesthesia was available.

The psychiatric work respecting these patients consisted of the following: First, an interview during the twenty-four hours preceding the operation. In this interview, a history of previous adjustment and possible psychiatric illness was obtained and an examination was made. The neurological, autonomic, and mental status was recorded with special reference to the amount of anxiety and the expectations concerning the operation, either anticipation of relief or dread of bad results. Such preoperative studies were available in 51 cases. For the follow-up study only 40 patients could be utilized. The others were excluded because of postoperative somatic complications (three deaths) or because they could not be reached. The patients were visited by a social worker and asked to return for an interview with the psychiatrist, no matter whether they did or did not have complaints. They were then interviewed and asked about their state of well-being, somatic complaints, changes in their emotional adjustment to the social environment and to husband and members of the family. Special attention was given to the question of sexual adjustment and to their own evaluation of the operation. Abnormalities in neurological and autonomic status were also recorded. In addition, a mental status was obtained with especial reference to mood, distortions of thinking, and alterations in perception. An effort was made to conduct the inquiry in the same manner as before the operation. Complaints were recorded as presented spontaneously and clarification was requested only after the complaint was presented. We were careful to avoid suggesting complaints through the manner of questioning.

Observations

In the series of 40 women whom we were able to study in interviews which occurred from ten months to eighteen months after the operation, we found 25 who had no new psychiatric complaints, who showed no change in emotional adjustment and in whom the operation had left no particular impression. Nine of these women were free of symptoms in their preoperative life, also. Five, however, had psychoneurotic traits and evidences of emotional instability and 2 had shown considerable anxiety before the operation. In two of these women who showed no essential change we, nevertheless, found the continuation of severe neuroses in which the personality make-up of hysteria and tendency to the development of somatic complaints without demonstrable structural basis had been in evidence. Two of them had numerous operations before entrance to this hospital and were demanding another operation at the time of the follow-up visit.

The 15 patients who had complaints had a free interval of at least three weeks and then developed more or less severe states

of discomfort in which sleeplessness, restlessness, agitation, loss of appetite, restriction in activity, and irritability were the most disturbing factors. Two typical examples of this type are the following:

1. H. F., age 51, was admitted August 2, 1939, because of excessive bleeding with menstruation, which lasted for three months. She was found to be in good physical condition except for the presence of a cervical polyp. Biopsy was advised to exclude malignancy. When seen before the procedure, the patient was confident, and almost cheerful. She thought of the operation as a matter of minor importance. She seemed not especially worried about the possibility of cancer, although her mother had died of cancer. She had no signs of autonomic instability. There was no history of psychoneurotic symptoms. However, there was a history of a period of depression at the age of 21, lasting two months, following her separation from the only man in whom she was ever interested, and another depressive period lasting about three months, in the late fall of 1938 when she found that she was unable to cope with the expanding demands of her professional position. She had remained single and had no active sexual life. She had developed, however, some regret about not having children. The patient left the hospital three days after the operation without complaints, having been reassured that there was no malignancy. For the subsequent three months she had no complaints, but then developed, suddenly, a state of severe agitation, sleeplessness, aversion to food and the delusion, or conviction, that she had ruined her associates in the agency in which she worked when she had left because of the onset of her previous depression. She developed suicidal ideas and had to be hospitalized. When interviewed six months later, she was found to be oriented, clear and in good contact. She immediately recognized the examiner and implored him not to leave the hospital because she was sure that he would be killed. She explained that she had not been able to eat because she was afraid that when chewing she might hurt people outside the hospital. She was markedly depressed and restless, and still insisted upon the chance to commit suicide, begging the examiner to give her poison in order to remove her destructive influence from the world.

A much milder condition is presented in the second case:

2. Patient R. D., age 39, had a total hysterectomy in May, 1938. At the time of her follow-up visit in May, 1939 she reported that she had been well for about four weeks after the operation. She then became unduly worried. "Little things worry me no end. I am all the time worried about the children. I have them dead and buried any time that something goes wrong with one of them." She sometimes is afraid she might lose her mind. She has frightening dreams. Someone seems to be chasing her and she is trying to hide; people seem to be breaking through locked doors; she seems to hear a baby crying. She is apt to break glass and china very easily because "I sometimes have an irresistible impulse to smash something." With all this, she is able to do her own work. She has seven children and does her own baking, cleaning and washing. She has found that it is much better for her to be very active. "I feel best when I have a lot to do. If I have nothing to do I get terribly nervous." The condition seems to be gradually becoming better now and she does not feel she needs any doctor any further. Preoperative observations: At the time of the operation the patient was rather frightened. She did not know exactly what was going to happen to her. She reported that she always has been "of the nervous type." Patient reports a preceding depression lasting about three months, twelve years ago, after the birth of her second child, which was a breech delivery and was born with a deformity.

A survey of the incidents characteristic of this type of condition shows the following:

1. Preoperative findings: None of the patients showed actual psychiatric disease at the time of the preoperative interview. Fifteen patients had signs of previous emotional instability (dizzy spells, fainting spells, anxiety attacks, exaggerated irritability, "swooning at the sight of blood"). Six had definite previous depressions; 13 had former operations and of these, two had a large number (4 or more) operations. The upper abdominal operations were cholecystectomies. The lower abdominal operations varied from simple dilatation and curettage or repair work, to total hysterectomy.

The patients' attitude toward the operation, at the time of the interview, varied from confidence and trust to outspoken anxiety. Twelve patients had manifest anxiety; others were evidently making an effort to hide their fear; some were under considerable social strain.

2. Postoperative findings: Twenty-five patients showed no change at all. Two patients reported marked relief of former psychiatric symptoms. Both had lacerated pelvic floor and had repair work done. One of them was much pleased over better sexual adjustment. The other had been frankly afraid that the operation might harm her in this respect but was greatly relieved that this did not occur (this woman had the belief that she had had only repair work done when actually she had had an hysterectomy).

Thirteen patients showed serious disturbances of their emotional adjustment to

persons around them. A characteristic type of behavior was a mild degree of agitation, restlessness, insomnia and a preoccupation with depressive thought content. In 10 members of the group who were distinctly depressed, observation disclosed preoccupation with thoughts of violence which intruded into consciousness: "I'm afraid I will hurt somebody. I am so scared I will do harm to my little boy." Three women had difficulty in restraining a tendency to expressions of violence towards their husbands and children. They were irritable and unable to control their temper. Three patients developed undue worry about the welfare and safety of husband and children, being haunted by phantasies that something awful would happen to them. There were, finally, 2 patients who were absorbed in self-condemnation and the expectation of doom for themselves. One patient developed a severe disintegration of her behavior, refused food, had the delusion that other people were dying on her account and became so seriously suicidal as to require institutionalization.

Almost all of the depressed patients showed a tendency to recurrent dreams dealing with horror, death and destruction. In 3 patients presenting such a condition, we observed preoccupation, not with the region of the operation, but with sensations in the mouth, tongue and teeth. Numbness of the teeth, a feeling that the tongue is too thick, a feeling of having to crunch something between the teeth and a tendency to look at the teeth in a mirror, worry that blood might come out of the mouth and dreams of blood gushing out of the mouth were mentioned.

The duration of the condition varied. The onset was from three to four weeks after operation. In 2 instances, the condition was still present at the time of the follow-up examination (sixteen and eighteen months, repectively, after the operation). The others subsided within six to eight months.

We were careful to determine whether or not the operation had merely accentuated a pre-existing condition (for instance, climacteric complaints). This was found to be true with one patient. In one case the patient had a depression which was complicated by a subsequent grief reaction following the death of her brother.

3. Comparison of preoperative observations with postoperative findings. Four of the depressive reactions occurred in individuals who had had previous depressions. They occurred twice as often in pelvic operations as in upper abdominal operations. There was, however, no relationship to age, preoperative anxiety or social strain. A very severe agitated depression with suicidal ideas developed in reaction to a simple dilatation and curettage. It was possible from the preoperative data to check our impression at the time of the operation concerning the liability of the patient to untoward reactions after the operation. Our predictions, based upon the presence of anxiety, and upon the history of recent emotional strain, preceding depressions or symptoms of emotional instability, turn out to be correct in only 8 of the 13 patients who developed the depressive syndrome described above.

Comment

Our studies show that in 13 of our 40 patients who had no preoperative psychiatric symptoms there could be observed a characteristic type of untoward psychiatric reaction, resembling a state of agitated depression. This reaction was much more common in pelvic operations than in upper abdominal operations.

We had hoped that a neuropsychiatric survey with emphasis on the autonomic status, the preoperative emotional adjustment and habitual ways of reacting to distressing situations might reveal valuable clues as to the possibility of postoperative psychiatric difficulties. One might expect that a person who seems well-adjusted and shows no preoperative anxiety has practically no liability to postoperative psychiatric difficulties. On the other hand, a person who shows much apprehension in the face of the operation and whose life situation is difficult might seem liable to have a stormy early postoperative course. A person who anticipates the operation with a sense of promised relief might not be liable to any severe postoperative reaction, but persons whose type of information is such and whose anticipations are such that the operation threatens mutilation and loss of sources of pleasure might be liable

to a more or less severe disturbance due to a state of frustration with irritability, restlessness and preoccupation with phantasies of revenge.

In our series of patients we encountered 13 who showed the type of irritability, restlessness and preoccupation with phantasies of violence which we might expect. We must, however, be clear about the fact that our criteria for predicting the occurrence of such symptoms were not present in 5 incidents of postoperative disturbances, and that of 25 patients who did not develop any psychiatric symptoms, we had expected postoperative difficulties in 8 cases. The most definite indication for the possible appearance of postoperative depressive symptoms is, from our series, the history of a previous depression in a person who has to undergo a pelvic operation.

The syndrome described here is so characteristic that it seemed worth while to watch for it in patients in the psychiatric out-patient clinic. Once our eyes were opened, we were surprised to find that we were able to collect a series of 23 patients within six months out of a total of 410, who presented the same picture and who had had pelvic operations within the preceding two years, in close time relationship to the onset of the disturbance. Some of them were self-limited conditions; others had continued for a considerable time and the patient seemed to be "stuck in a rut," out of which she could not lift herself. Since the condition resembles an agitated depression and since these women were, for the most part, in their late thirties or early forties, the prognosis would, at first, seem rather poor. We felt justified in trying in the psychiatric clinic to interpret to the patients their present condition as a direct outcome of a violent reaction of the organism to an operation in which they felt mutilated, that a rage response had been activated, that this rage response had to find outlets, and that their disturbing experiences could be viewed as awkward attempts at obtaining gratification for these primitive needs. We found that on the basis of this rationalization, 10 of the women were able to attain considerable improvement in their adjustment.

The tendency to demand further operations, which we observed in two cases of psychoneurotic reaction type, has been described in studies of the various forms of hysteria, most recently by Greenacre(11) and Lindemann(12). It is usually not possible to do much for these individuals through psychotherapy.

The various forms of postoperative depressions have recently been discussed by H. Deutsch(13) who, in the process of free associations, obtained information from her patients after they had experienced surgical operations. She found insomnia, depression and a tendency to dramatic dreams. She also noticed a preoccupation with the mouth and nose similar to that shown by some of our patients. She emphasizes that manifest anxiety before the operation does not necessarily indicate liability to postoperative psychiatric difficulties.

From our own studies, it seems that only a considerable amount of time spent with a given patient will make it possible to understand what the operation means to her in her emotional adjustment. Only rarely will it be possible to elicit the complicated interplay of motivations and fears which serve as a plausible explanation for her abnormal response to the operation. However, more searching study of a larger number of patients will be needed to find typical patterns of response which may be recognized and handled successfully before the operation. Only then we may expect with certainty that a series of psychiatric interviews before an operation may prevent a subsequent untoward response. At present, we must be content to state that in this series we could not confirm certain plausible assumptions, for instance, that the display of anxiety before the operation is an indication of probable later psychiatric difficulties.

From our study, it seems that about 40 per cent of pelvic operations in women may be followed by a condition having certain features characteristic of agitated depression, beginning about a month after the operation and lasting more than six months. The condition may be mild, but in some cases may lead to marked impairment of social adjustment and even to institutionalization. In most instances it will be necessary to carry through the operation, in spite of this expec-

tation, but by psychiatric interviews we may learn more and more to identify patients most liable to serious reaction and even if we cannot avoid the reaction, we can inform the family beforehand and, after the reaction has occurred, may be able to assist the patient by psychotherapy.

Summary

1. Fifty-one women, aged 20 to 55, were given a neuropsychiatric examination before major abdominal surgery, with special reference to anxiety concerning the operation, history of former psychiatric difficulties, marital maladjustment and sources of environmental stress.

2. Forty patients who had no somatic complications and whose convalescences were uneventful, were reexamined after an interval of from twelve to eighteen months.

3. Twenty-five of these patients showed no change in their psychiatric status. Two patients showed relief from former psychiatric complaints.

4. Thirteen patients showed a picture of restlessness, sleeplessness, agitation and preoccupation with depressive thought content beginning from three to four weeks after the operation and lasting more than three months.

5. The relative frequency of this postoperative condition was much higher in pelvic operations than in cholecystectomies; it occurred more frequently in persons who had had depressive episodes in their former life.

6. The incidence of this condition in our series shows no significant relationship to the presence of preoperative anxiety, to sexual maladjustments or to environmental factors as elicited in the preoperative interview.

7. Reliable predictions as to postoperative psychiatric course will be possible only after more detailed studies.

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DISCUSSION

Dr. M. M. Zinninger (Cincinnati, Ohio).—This report of Dr. Lindemann's calls attention to a fact which is too frequently overlooked by surgeons, namely, that traumatic injuries of various sorts may have implications psychogenically as well as somatically. Surgeons have known and emphasized for a long time that injury to tissues, loss of body fluids, particularly blood, induction of anesthesia, bring about conditions which they call traumatic shock; however, they are often so busy with the mechanical aspects of their intervention that they overlook some of the psychogenic factors and the fact that this type of trauma may produce changes in the individual.

I am not entirely convinced from the data presented that changes described have been wholly due to the operative procedure. I am equally unable, of course, to say that they are not. It seems certain to me, however, that inquiries of this type should be extended because if it could be predicted beforehand which patients would be likely to have this type of response such information would be of great value to the surgeon.

It also might be of some value in improving diagnoses and preventing operations where they were not really necessary. The old idea that one hears expressed sometimes even in these days, that a look will do no harm, I believe is wholly wrong,

and that operations for diagnosis only, in general, should be abandoned. In these days of multiple stage operations the surgeon has only to go into the abdomen the second time, after intervention a week or three weeks earlier, to see how much change has occurred in the abdominal history and to realize that only the slightest look is not entirely without certain consequences.

There is another aspect of this problem which I believe is still incompletely explored, and that is the relation between the histopathological changes in the brain and visceral disease. Dr. Vonderahe of this city has recently presented evidence, particularly in complicated peptic ulcers, that ulcers appear in the hypothalamic region and in the region of the vagus nerve which he believes are brought about by visceral disease, and it seems possible that not only visceral disease itself but traumatic attacks on the viscera may produce changes of this sort.

Dr. Edward G. Billings (Denver, Colo.).—Dr. Lindemann has contributed some specific data that are very welcome to those of us working in close collaboration with physicians caring for general medical and surgical problems. I congratulate Dr. Lindemann on this study which he is beginning.

At the Colorado General Hospital in Denver we have done some studies on personality reactions in relation to operations. In the instances of lower abdominal operations in women we, too, have seen many psychiatric disorders occurring from one to four weeks subsequent to the surgical procedures. At least one-half of these reactions were of the general nature described by Dr. Lindemann and characterized by a peculiar sort of depression, often obsessive thinking, even compulsive trends, and colored by anxiousness. In many of these cases it is our feeling that the psychiatric disorders were existent for some time prior to operation. This, of course, is very difficult to determine satisfactorily for two reasons:

First, by the time the patient comes to the hospital, she has been given, at least by implication, a tentative diagnosis and is resigned to or initially able to accept therapy directed at her soma. With all this, along with entering the hospital, she gains a sense of security and hope. The result is a temporary amelioration in the disorder of mood, if one exists. The operation, sedation, the fact that the patient becomes more or less dependent on others, often cause still more of a temporary modification of the affective-regulatory functions. The result is that from one to four weeks, or until the patient emerges from the convalescent period, it is nearly impossible to learn from her much about any mood or other personality disorder, chiefly because it has been subordinated temporarily and the patient is less aware of it.

Second, with convalescence ending, the patient is expected, both by herself and others, to resume responsibility for her own personal government and must again take her regular place in life. Having to shoulder these responsibilities, she is apt to feel less secure than ever, provided her previous symptoms return. She also has fewer functions with which to effect an adjustment. The result is that the operative and hospital experience still further clouds the patient's discriminative memory for the preoperative problems, and thus makes it difficult for the physician to elicit the true facts.

At Colorado General Hospital we feel that unless the patient's condition is unquestionably one requiring immediate surgery, it is to her advantage to have a few days in the hospital for study before operation. This period allows us an opportunity to ascertain a few leads to any possible underlying personality problem. A few of the items we particularly go for are:

1. A detailed description of the patient's complaint problem is obtained. Are there evidences of any biological components of a mood disorder or physiological dysfunctions possibly indicative of an underlying personality reaction? If so, these leads are followed up.

2. The degree of the patient's health consciousness and that of her family and home are gone into.

3. The patient's concept of the anatomy involved or implicated and her beliefs of what might result from the operation are evaluated, as Dr. Lindemann mentioned.

4. Does falling behind in schedules and not keeping up with the work at home or in the office lead to feelings of insecurity and inadequacy, depression, anxiousness, etc? If so, we know we have perhaps some therapeutic work ahead of us before the patient leaves the hospital.

5. How easily is the given personality disorganized by any toxic and infectious factors, by emotional strain, etc.? Some individuals require more than the average time to reorganize themselves following operation. If they are released to assume their usual responsibilities too early, they are liable to adverse reactions to the usual problems.

I would like to ask Dr. Lindemann a question. He mentioned that one-half of the patients reported were between the ages of twenty and forty years. I am wondering if the majority were closer to age thirty than to twenty or forty? In our own studies we have been struck by the fact that women between the ages of twenty-seven and thirty-three are inclined to self-scrutiny, feelings of insecurity in their relationship to outside problems, greater awareness of their bodily functions and mild depressive reactions.

Dr. Erich Lindemann (Boston).—In the short time available I could not cover all the details of our technic of interrogation, and we are fully aware of the dangers of error in this respect. We have tried to make sure that there was no psychiatric condition that we might have overlooked by getting from the members of the family a detailed account of the patient's behavior before the operation, to which we could turn for information as to the extent to which the patient was handicapped by her physical ailment, how it had influenced her attitude toward the family before the operation; and we felt very sure that none but the 8 patients

mentioned as having severe neuroses on account of difficulties before the operation were actually so handicapped.

I feel that much more detail before the operation is needed to get adequate criteria for prediction. The attitude of the patient toward the operation is anxious anticipation. It would fall in very well with hypochondriacal worry of a sort which Dr. Billings apparently has in mind.

I am gratified to learn that a study of a similar type is going on in Denver. Such a check should be most helpful.

As to the question of age distribution, the peak of our distribution was in the early forties, not in the early thirties, but I quite agree with Dr. Billings that in the early thirties, particularly in single women, one is likely to find anxious preoccupation about the future, about the meaning of life, with slightly depressive coloring.

As concerns necessity of operation, it seems that in our particular cooperative system we would probably be called in consultation in any case in which there was any doubt about the proposed operation, and about the injury to which one would dare to expose the patient.

The relative frequency of untoward reactions after pelvic operations is rather startling. Just two years ago Dr. Ebaugh wrote about it, and he mentioned then that no systematic study was available.

With regard to Dr. Zinninger's remarks, I feel very gratified by the attitude of the surgeon in this matter. We feel that surgeons have generally quite an awareness of the psychological implications and that they welcome psychiatric collaboration in determining the desirability of operation.

We have seen lately, in a careful evaluation of patients with ulcerative colitis, that there is a very definite change in personality adjustment in these individuals, a change which cannot be labeled neurosis, but which is very suggestive of a change of physiological nature in the vegetative centers; and we have in some x-rays and some careful studies of vegetative functions hints that there may be a line of great importance to be followed later.

AN ANAPHYLACTIC RESPONSE DURING INSULIN SHOCK THERAPY OF SCHIZOPHRENIA

A Detailed Case Report with Follow-Up Studies

By EDWARD N. HINKO, M. D., MERYL M. FENTON, M. D., and HARRY BALBEROR, M. D.

Eloise Hospital, Eloise, Michigan

Insulin sensitivity during the course of insulin shock therapy, as denoted by the progressively earlier appearance of coma and necessitating the reduction of the shock dose to one-half or one-third of its original size, has been frequently noted in patients subjected to repeated deep shocks. This phase of insulin sensitivity as well as the local allergic reactions that occur, has been adequately described in the literature. But the occurrence of anaphylactic shock as a manifestation of true sensitivity to insulin during shock therapy of schizophrenia is considered extremely rare. We are not aware of a similar detailed case report in the literature.

CASE REPORT

O. W., a thirty-year-old negro, married, was admitted to the psychiatric division of Eloise Hospital in October, 1940. His family history revealed no evidence of mental illness or outspoken personality disturbances.

Personal History.—There were no known abnormalities of birth or early development. Physical health was considered good and there was no history of previous allergy. He was over-protected by his mother and was described as conscientious, dependable, determined, sensitive and secretive. He usually entertained a nebulous outlook on life; occasionally his plans for the future were idealistic. His interest in religion was sincere but not fanatical. He was an able pianist and vocalist and for several years was the leader of the choir of a local Baptist church. Scholastically, he made a satisfactory adjustment and earned a Bachelor of Arts degree in 1935. In the early part of 1940 he married a girl with whom he had been acquainted for several years.

Present Illness.—Approximately one year prior to hospitalization the first symptoms of mental illness were noted. The patient complained of lack of energy and loss of ambition and initiative. Gradual withdrawal from reality, as denoted by periods of preoccupation, distractibility and diminution of social activities, was noted several months later. The appearance of projection mechanisms was largely responsible for his hospitalization. He related to relatives that many people were watching him and were planning to harm him. Previously a reliable employee performing routine clerical work, he became unable to perform his duties, and was granted a leave of absence for the purpose of obtaining treatment.

Status on Admission.—Physical examination revealed a well-developed and fairly well-nourished, colored male. Weight, 125 pounds. Height, 5 feet 5 inches. He was not acutely ill and no findings indicative of chronic illness were noted. Blood pressure was 130/90. Neurological examination revealed no pathological findings. Routine laboratory findings were within normal limits. Blood and spinal Kahn and Kline were negative.

Psychiatric examination revealed the patient to be mildly preoccupied, quiet and periodically uncommunicative. He answered questions evasively with occasional initial retardation and blocking, displayed flattening of affect and occasional inappropriate affective responses. Feelings of unreality, ideas of influence and reference, auditory and visual hallucinations and paranoid trends were elicited. Attention and concentration were poor, but memory was not impaired. Orientation was approximately correct. Insight was considered minimum and inadequate. Psychometric examination: M. A. 17. I. Q. 113. Diagnosis was schizophrenia, catatonic reaction type. He was considered a suitable candidate for insulin shock therapy after the following laboratory studies failed to reveal any contra-indication to treatment.

Electrocardiogram: Normal.

Roentgenogram: Six-foot chest plate showed a slight fullness in the auricular region and an increase in the broncho-vascular markings, but no active pathology.

Urinalysis: Sp. gr. 1.017. Albumin and sugar—negative. Microscopic examination 3-4 W. B. C. per H. P. F.

Blood count: Hemoglobin (H. H.) 14.0 gm. R. B. C.—4,800,000. W. B. C.—4,050. P. M. N.—67. (F.—66. N. F.—1.) L.—28. M.—2. B.—1. E.—2.

Blood chemistry: Non protein nitrogen—30 mg. per cent. Cholesterol—250 mg. per cent. Phosphorus—3.1 mg. per 100 cc. plasma.

Bromsulphalein: 5 per cent in 30 minutes.

Glucose tolerance: 2 dose, 1 hour method.

Specimen	Blood sugar	Urine sugar
Fasting	79	Negative
½ hour	86	.....
1 hour	77	Negative

Course.—He was started on insulin shock therapy December 19, 1940, with a dose of 20 units of U 40 standard insulin given subcutaneously at 6 a. m. Treatment was given at 6 a. m. Monday through Friday of each week with the exception of holidays (December 25–January 1). The following table indicates the progress of treatment prior to the occurrence of the anaphylactic reaction January 13, 1941, when the 16th treatment was given:

Date	No. of Treatments	Insulin*		Reaction	Termination of hypoglycemia	
		Amount	Kind		Time	Manner
12/19/40	First	20 units	U 40	Perspiration	10.15 a. m.	Fruit juice by mouth
12/20/40	Second	25 units	U 40	Perspiration and restlessness	10.15 a. m.	Fruit juice by mouth
12/23/40	Third	35 units	U 40	Drowsiness, perspiration. Complained of hunger.	10.15 a. m.	Fruit juice by mouth
12/24/40	Fourth	40 units	U 40	Drowsiness, perspiration. Restlessness.	10.15 a. m.	Fruit juice by mouth
12/26/40	Fifth	45 units	U 100	Drowsiness and perspiration.	10.15 a. m.	Fruit juice by mouth.
12/27/40	Sixth	50 units	U 100	Drowsiness, perspiration. Stupor.	10.15 a. m.	Fruit juice by mouth.
12/30/40	Seventh	55 units	U 100	Coma.	9.50 a. m.	100 cc. 50 per cent glucose I. V.
12/31/40	Eighth	55 units	U 100	Drowsiness, perspiration. Excitement.	10.00 a. m.	Fruit juice by mouth.
1/ 2/41	Ninth	60 units	U 100	Coma.	9.15 a. m.	100 cc. 50 per cent glucose I. V.
1/ 3/41	Tenth	60 units	U 100	Stupor. Excitement.	9.30 a. m.	Fruit juice by mouth.
1/ 6/41	Eleventh	65 units	U 100	Drowsiness, perspiration. Excitement.	10.40 a. m.	Fruit juice by mouth.
1/ 7/41	Twelfth	70 units	U 100	Pre-coma. Excitement.	10.55 a. m.	Fruit juice by mouth.
1/ 8/41	Thirteenth	75 units	U 100	Marked excitement.	10.50 a. m.	Fruit juice by mouth.
1/ 8/41	Fourteenth	85 units	U 100	Pre-coma. Excitement.	10.30 a. m.	Fruit juice by mouth.
1/10/41	Fifteenth	95 units	U 100	Pre-coma. Lucid and alert.	9.50 a. m.	Fruit juice by mouth.

* Standard insulin—Stearns.

On January 13, 1941, he received his 16th injection consisting of 105 units of insulin (U 100) at 6 a. m. and almost immediately afterward experienced a generalized pruritis. At 6.20 a. m. he complained of "not feeling well," became nauseated, vomited clear fluid and had an involuntary bowel movement. At 6.30 a. m. he was semi-stuporous, skin was cold and clammy and it was impossible to detect a radial pulse. He received a hypodermic injection of 0.5 cc. of suprarenin (epinephrine solution 1:1000) and 100 cc. of 50 per cent glucose intravenously. He was shivering, complaining of feeling cold and hot water bottles and extra blankets were applied. There was considerable edema of the face, particularly of the eye-lids and lips. The patient continued to complain of generalized pruritis, took two cups of sweetened fruit juice and hot coffee, but refused solid food. At 8.30 a. m. he was still semi-stuporous, his responses were delayed and his speech was slow and somewhat thick. Blood pressure and pulse were still unobtainable. Heart tones however were of fair quality; no murmurs or arrythmia noted. Lung fields were clear. Blood sugar determination at 9 a. m. was 50 mg. per 100 cc. Non protein nitrogen was 44 mg. per cent. He was given another injection of 0.5 cc. of suprarenin subcutaneously and 100 cc. of 50 per cent glucose with one ampule (15½ grains) of calcium gluconate intravenously. At 9.15 the radial pulse was palpable but poor in quality. Blood pressure was 70/62. At 9.20 a. m. he received one ampule (7½ grains) of caffeine sodium benzoate. At 9.45 a. m. the pulse was readily palpable, strong in quality, blood pressure was 140/80. The patient was alert, coherent and relevant, but complained of feeling tired. Radial pulse continued to be of good quality, the rate varying between 92 and 110 throughout the day. At noon blood pressure was 110/72, temperature 99.6, pulse 92, respirations 20. At 4 p. m., blood pressure 120/78, temperature 99.8, pulse 100, respirations 20.

The edema of the face gradually subsided and on the following morning was no longer noticeable. The patient was kept in bed another twenty-four hours and then allowed up—having no complaints and displaying no unusual symptoms. Prior to the date of this anaphylactic reaction, the patient had been showing progressive improvement in mental status. As far as could be ascertained this unusual experience did not influence his progress in any way.

Follow-Up Studies.—About two weeks after the occurrence of this anaphylactic reaction, the patient was referred to the allergy clinic for study. Intradermal tests were performed on the forearm, using a tuberculin syringe and No. 26 gauge needle. The following results were obtained.

	5 minutes	15 minutes
1–28–41.. Standard insulin U 40 (Stearns) 0.03 cc.....	Wh. 21 x 13 mm. 3 pseud.	Same
Crystalline zinc insulin U 40 (Squibb's) 0.03 cc.....	Wh. 27 x 15 mm. 4 pseud.	Same

At thirty minutes the reactions were proportionally larger but flattened out.

2– 4–41.. Beef 1 : 500 0.03 cc.
Lamb 1 : 500 0.03 cc.
Pork 1 : 500 0.03 cc.
Veal 1 : 500 0.03 cc.
} All negative in 15 and 30 minutes.

2–16–41.. Passive transfers to 3 non-allergic recipients using 0.10 cc. of patient's serum (undiluted).
2–17–41.. Two passively sensitized sites tested with 0.03 cc. of U 40 Stearns insulin—negative.
2–18–41.. Remaining patient tested by same method—also negative.
2–26–41.. Passive transfers repeated on one allergic and three non-allergic recipients with 0.10 cc. of patient's serum (undiluted). Sensitized areas tested 20 hours later were negative to protamine zinc insulin, crystalline insulin, and standard insulin. Controls were negative.
3– 4–41.. Patient re-tested intradermally with following results:

	5 minutes	45 minutes
Crystalline U 40 (Squibb's) 0.03 cc.....	Wh. 29 x 16 mm. 4 pseudo.	31 x 19 mm. no pseudo.
Standard U 40 (Squibb's) 0.03 cc.....	Wh. 17 x 15 mm. 2 pseudo.	18 x 15 mm. no pseudo.
Protamine U 40 (Squibb's) 0.03 cc.....	Wh. 14 x 11 mm. no pseudo.	15 x 10 mm. no pseudo.

Summary of Allergy Studies

1. Patient was found to be definitely sensitive to insulin as demonstrated by repeated positive intradermal skin tests to crystalline, standard, and protamine zinc insulin.

2. The reactions to crystalline insulin were uniformly larger than to standard or protamine insulin.

3. No sensitivity to animal proteins such as beef, lamb, veal and pork was found.

4. No skin sensitizing reagins could be demonstrated in the circulating blood by repeated passive transfers in seven subjects not sensitive to insulin.

5. Positive skin sensitivity to insulin in this patient was still present seven weeks after the anaphylactic reaction.

Conclusion

It is hoped that this report will serve to stimulate further investigations to close the gaps which exist in the knowledge of allergy to insulin, and to emphasize that sensitivity to insulin during shock therapy in the treatment of schizophrenia is not limited to decrease in tolerance and to local reactions, but may suddenly become manifest as an anaphylactic reaction demanding prompt and appropriate treatment.

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COMMENT

RETIREMENT OF PROFESSOR ADOLF MEYER

The retirement of Professor Adolf Meyer from the Chair of Psychiatry at the Johns Hopkins Medical School and from the position of Director of the Henry Phipps Psychiatric Clinic is an outstanding event in the history of American psychiatry.

For over thirty years the Phipps Clinic has exerted an extraordinarily fruitful influence upon psychiatric thought, and pupils have flocked to the Phipps Clinic not only from all over the United States but also from over the seas.

Throughout the whole of the United States the influence of Meyer's teaching at the Phipps Clinic can be traced. The keynote to this teaching has been the insistence on a broad and comprehensive as well as intensive study of the human personality and of the interactions between the individual and his social environment. Upon this broad background Meyer placed the wealth of observations which were being accumulated by the development of specialized methods. He was alert to the importance of these methods, and his own contributions to the anatomy and pathology of the central nervous system pay tribute to the importance of the basic sciences. His sober and critical evaluation of current theories has had a wholesome and steadying influence on the psychiatry of this generation.

The close contact of Meyer with problems of community organization and social development as well as with problems of medical education has made his influence felt in wide circles, and it is expected that even after his retirement from his professorial position he will continue to exert a stimulating and directing influence on many projects which deal with the social welfare of the community.

C. M. C.

CENTENNIAL OF THE DEPARTMENT FOR MENTAL AND NERVOUS DISEASES OF THE PENNSYLVANIA HOSPITAL

On Wednesday and Thursday, June 11 and 12, 1941, the Pennsylvania Hospital celebrated the Centennial of its separate department for mental diseases. Mental patients had been treated at the Pennsylvania Hospital at Eighth and Pine, founded in 1751, prior to the opening of the "new" department, a separate building for mental patients on a farm in West Philadelphia. In the 1820's and prior to the opening of this new department, January 9, 1841, the mental patients in the original hospital in the city numbered more than half of the total patient population. This close association with the general hospital had its advantages, as is again recognized in these days, and secured for the insane the interest of eminent clinicians such as Benjamin Rush and his successor John C. Otto (of haemophilia fame), not to mention many others. The removal to an ample site (over 100 acres) in the open country (as it was then) and yet accessible to the town with its "sights," was largely motivated by the desire to afford large facilities for entertainment, exercise and occupation for which Rush had yearned, and which Kirkbride rapidly developed to a complexity and perfection hardly regained "after the most strenuous efforts of the last ten years" (Bond). Under Dr. Chapin (1885) out-patient work in preventive psychiatry was begun and has since continued at the hospital in the city (Dr. Brush, Dr. Strecker, Dr. Fuller and many others). The celebration also marked the completion of ten years service to the patients with personality problems in the resident and out-patient clinics of the Institute.

On Wednesday evening a medical meeting was held at the Institute which emphasized

recent advances in psychiatry. The program was as follows:

Introductory Remarks, Lauren H. Smith, M. D., Physician-in-Chief and Administrator.

The Function of the Department for Mental and Nervous Diseases, Donald W. Hastings, M. D., Clinical Director, Thurston D. Rivers, M. D., Internist and Research Therapist, Elmer V. Eyman, M. D., Chief of Service.

The Function of the Institute, Harold D. Palmer, M. D., Senior Psychiatrist, Louis H. Twyeffort, M. D., Chief Resident Psychiatrist, Kenneth E. Appel, M. D., Senior Psychiatrist.

The Function of Special Services, Joseph Hughes, M. D., Director of Laboratories, K. E. A. Elliott, PH. D., Research Biochemist, Paul Dozier, M. D., Psychiatrist, Edward M. Westburgh, PH. D., Director of Psychological Service.

Summary and Discussion, Earl D. Bond, M. D., Director of Research, Edward A. Strecker, M. D., Consultant-in-Chief.

On Thursday afternoon there was an inspection of both units and in the interval Dr. Earl D. Bond spoke on "The Hospital in Eighteen Forty-One," sketching in his inimitable way the sanity as well as the foibles and crudities of that period. He laid particular stress on the variety and individualization of occupational therapy as early as 1843. Dr. Edward A. Strecker followed with a paper contrasting the activities and interests of "Nineteen Forty-One."

There were exhibits at the department for mental and nervous diseases: old furniture and musical instruments, paintings by Benjamin West, magic-"lanthorns" with colored and movable slides of 1845, elaborate stereoscopes of the '60's, and physical apparatus used in "instructive" lectures. There was also an organized exhibit of books, manuscripts, plans, engravings and photographs illustrating the history and physicians of the Pennsylvania Hospital, in its mental and nervous wards and departments (from 1751 to 1841) correlated with the nosology of mental diseases, the latter typified by twelve "peaks" (Boerhaave to Bleuler) selected from the libraries of the hospitals. The corresponding Pennsylvania Hospital physicians were: Bond, T., Rush, Otto, Kirkbride, Chapin, Copp and Bond, E. D.

At the Institute there were charts and exhibits illustrating electroshock therapy (American Psychiatric Association 1941 exhibit); electroencephalography; dried blood serum (first developed for the treatment of shock and hemorrhage at this hospital in conjunction with the department of bacteriology of the University of Pennsylvania); clinical and experimental studies on segmental pain and tenderness (American Medical Association 1941 exhibit); laboratory demonstration of work in tissue metabolism; spontaneous artistic productions with psychopathological content (selected from permanent exhibit of art by mental patients).

The long and rich history of the Pennsylvania Hospital, and of its department for mental diseases in particular, were worthily honored and commemorated by the centennial celebration of the founding of the latter institution, which has played so large a role in the development of American psychiatry.

THE NEW FORMAT

Ninety-seven volumes of the JOURNAL have been issued without material change in outward dress or size of page. In 1921, with the adoption of the amended constitution, The American Medico-Psychological Association became The American Psychiatric Association, and at the same time its official organ which, since its origin in 1844, had been published quarterly as THE AMERICAN JOURNAL OF INSANITY, assumed its new title—THE AMERICAN JOURNAL OF PSYCHIATRY.

Prior to 1921 subscription to the JOURNAL had been optional with the members of the Association; but at the annual meeting that year it was voted to make each member, by payment of slightly increased dues, automatically a subscriber.

The JOURNAL continued as a quarterly publication until 1927, when it was placed on a bi-monthly basis and its editorial staff, which previously consisted of the editor and four associates, was enlarged to include thirteen associates and collaborators. The editor, Dr. Brush, announced these changes in anticipation of his contemplated early retirement. Yielding however to the earnest

solicitation of his colleagues he deferred this move until 1931.

With the greatly enhanced interest in the mental sciences and the widening scope of psychiatry within recent years there has been a remarkable increase in the membership of the Association despite, or perhaps because of, more rigid requirements in the qualifications of candidates. Besides the expanding circulation of the JOURNAL occasioned by the growing membership, there has been a marked increase in the number of subscriptions from all parts of the world.* To this gratifying result the enterprise of Mr. Austin M. Davies, who was appointed Executive Assistant in 1933, has contributed in large measure. Along with these signs of healthy growth there has been a parallel expansion in the annual program and in the material submitted for publication.

At the 1921 meeting in Boston the register of the Association showed 987 members, and the secretary's report proudly demonstrated that the new members elected at this meeting brought the membership "well beyond a thousand." The annual volume of the JOURNAL for that year contained 725 pages.

One decade later, when the present editorial staff assumed its duties, the total membership was 1356. The increase for the year was 13. The JOURNAL for the year which closed with the 1931 meeting numbered 1086 pages.

Another decade has passed. When the Association met in Richmond this year the register contained 2405 names. During the meeting 295 additional members were voted in, marking the largest annual membership increase to date. The corresponding volume of the JOURNAL had reached the record figure of 1520 pages.

A comparison of the annual volumes for the years 1921, 1931 and 1941 shows that in the earliest of these, the first to be issued under its new name, 35 original articles were published. The 1931 volume contained 49 papers. During the year just closed the JOURNAL published 95 contributions.

It is obvious that it has become increasingly difficult to accommodate this expanding bulk to a format which had been adequate ten years ago. Comment has often been heard that the disproportionate thickness of bound volumes in recent years makes them unwieldy and too space consuming on library shelves.

The new format is designed to meet the needs of the present, and to bring the JOURNAL up to date in appearance and convenience of handling in keeping with the quality of its content. We hope that its readers, grown accustomed to the old form—older than the memory of any of them—may not too reluctantly bid adieu to the old nor withhold their approval of the new.

*As Europe passed into the night, scientific exchange with that Continent inevitably suffered grievously.

NEWS AND NOTES

MEETING OF THE AMERICAN PSYCHIATRIC ASSOCIATION.—The 97th annual meeting of The American Psychiatric Association was held in the Hotel Jefferson, Richmond, Virginia, May 5 to 9, 1941. Due to the large attendance of 1453 space in eight other hotels in the city was utilized.

The committee on arrangements, under the chairmanship of Dr. R. Finley Gayle, Jr., with James Asa Shield, M. D., as vice-chairman, did a splendid piece of work in extending true Southern hospitality to all members and guests. Dr. Howard R. Masters, of the committee on arrangements, was especially helpful in arranging for hotel accommodations for the record breaking number in attendance at this meeting. A splendid program of entertainment was arranged for women guests by a committee under the chairmanship of Mrs. Edward H. Williams of Richmond. The motion picture program, under the direction of Dr. John D. Reichard of Lexington, Kentucky, was especially constructive. The scientific exhibit, under the direction of Dr. Abraham Myerson, with the cooperation of Dr. David C. Wilson and Dr. Walter L. Bruetsch, was the largest and most informative exhibit that the Association has ever held.

An added part of the program of 1941 was the symposium "The Psychiatrist and the National Emergency" under the auspices of the Surgeons General of the Army and the Navy, the Director of the Selective Service System, the Administrator of Veterans Affairs, the Administrator of the Federal Security Agency and The American Psychiatric Association Committee on Military Mobilization. The symposium began Sunday afternoon and continued through the evening and all day Monday. This was an especially important and timely addition to our program and all sessions were well attended.

On Monday morning a joint session of the section on convulsive disorders and The American Chapter of the International League against Epilepsy was held in the Auditorium with Albert W. Pigott, M. D., in the chair. Also on Monday morning the section on forensic psychiatry was held in the Flemish Room. On Monday afternoon the joint session of the section on convulsive disorders and The American Chapter of the International League Against Epilepsy was held in the Auditorium under the chairmanship of Tracy J. Putnam, M. D., followed by a business session of section on convulsive disorders of The American Psychiatric Association. Also on Monday afternoon another section on forensic psychiatry was held, at which time reports were presented from the committee on mental deficiency and crime, the committee on prisons, committee on juvenile delinquents, and the committee on therapy and crime. In the evening, in the Auditorium, a subscription dinner was held by the joint session on convulsive disorders and epilepsy, followed by an entertainment, and, simultaneously, in the Flemish Room, the section on forensic psychiatry held a dinner meeting. This was followed by a discussion on "Forensic Implications for our National Emergency." Dr. Lowell S. Selling was the moderator for this period, and the discussants were: Edgar Gerlach, Warden, Federal Correction Institution, Austin H. MacCormich, Executive Director, The Osborne Association, New York; and Lieut. Col. Ernest H. Burt, Judge Advocate General's Office, Washington, D. C.

On Tuesday morning the first business session convened at 10.20 o'clock in the Jefferson Hotel, the President, Dr. George H. Stevenson, presiding. The invocation was given by Rabbi Edward N. Calisch and Dr. Beverley R. Tucker gave an address of welcome, presenting to the Association many important historical events occurring in the State of Virginia. A letter to the President of the Association from the President of the United States was read. Dr. James K. Hall, President-elect, responded to the addresses of welcome.

Next followed reports from Dr. R. Finley Gayle, Jr., for the committee on arrangements, Dr. Karl M. Bowman, chairman of the committee on program, and the report of

the Council by Dr. Arthur H. Ruggles, secretary-treasurer.

The minutes of the Council and Executive Committee of the previous meeting were read and approved, the report of the secretary was read and accepted, and the financial report of the executive assistant and budget for 1941-42 were presented and approved.

Three section meetings on Tuesday afternoon included treatment by physical methods, administrative problems, and a symposium on schizophrenia.

On Tuesday evening ten round tables were held, the subjects being cooperation between psychiatry and psychiatric social work in the social problems of today, electric shock therapy, mental hygiene, occupational therapy, play techniques, psychiatric treatment of chronic alcoholism, Rorschach test, the qualifications of a psychoanalyst, training and licensing of psychiatric attendants, and Veterans' Administration.

On Wednesday morning there was a joint session with the section on psychoanalysis, with Dr. Karl A. Menninger as chairman, a section on clinical studies with Dr. Earl D. Bond acting as chairman, and one on brain pathology, with Dr. Clarence O. Cheney as chairman.

On Wednesday afternoon there were three section meetings, including a symposium on experimental investigations in the psychoneuroses, a joint session of the section on psychoanalysis and the American Psychoanalytic Association, and one on miscellaneous topics.

On Wednesday evening the annual dinner was held in the Auditorium ballroom with Dr. George H. Stevenson as the presiding officer. The features of the dinner were the presentation of Fellowship certificates by the President, the introduction of President-elect, James King Hall, and a most impressive annual address, dealing with the present situation in Britain and America was given by Sir Gerald Campbell, Minister from Great Britain. The Sabbath Glee Club furnished a most interesting program, and this was followed by dancing.

On Thursday morning there were three section meetings (1) pharmacological shock treatment; (2) joint session with the section on mental deficiency and (3) physiological clinical studies. In the afternoon there was a sightseeing trip to interesting and historical points in and around Richmond, the tour ending at Westbrook, where an old fashioned Virginia brunswick stew, barbecue and picnic supper was given.

On Thursday evening a public meeting was held in the Auditorium sponsored jointly by The American Psychiatric Association and the Mental Hygiene Society of Virginia, with the President, Dr. George H. Stevenson, presiding.

On Friday morning there were three sections, the subjects being aspects of morale, electric shock therapy and alcohol, and on Friday afternoon the subjects were electroencephalography, extra-mural psychiatry and miscellaneous topics.

In his report as secretary, Dr. Ruggles gave the total membership at the present time as 16 Honorary Members; 61 Life Members; 4 Corresponding Members; 851 Fellows; 1278 Members; 195 Associate Members. 210 new Members and 85 Associate Members were elected; 17 were transferred from Associate Members to Members and 37 to Fellowship. The Association stood while the secretary read the list of members deceased during the past year, and a memorial to Dr. H. Douglas Singer, President-elect, was read by Dr. C. Macfie Campbell.

The following were elected officers for 1941-42:

For President: James K. Hall, M. D., Virginia.
For President-elect: Arthur H. Ruggles, M. D., Rhode Island.
For Secretary-Treasurer: Winfred Overholser, M. D., District of Columbia.
Council members elected for three years: G. H. Stevenson, M. D., Canada; Roscoe W. Hall, M. D., District of Columbia; J. D. Reichard, M. D., Kentucky; and Karl A. Menninger, M. D., Kansas.
Auditor for three years: Chester Carlisle, M. D., California.

The following were elected officers of the sections for 1941-42:

Section on forensic psychiatry: Dr. Walter Bromberg of New York, chairman, and Dr. Philip Q. Roche of Philadelphia, secretary.

Section on psychoanalysis: Dr. M. Ralph Kaufman of Boston, chairman; Dr. Philip R. Lehrman, of New York, chairman-elect; Dr. William C. Menninger of Kansas, secretary.

Section on mental deficiency: chairman, Dr. Harry C. Storrs of Letchworth Village, New York; secretary, Dr. Oscar J. Raeder of Boston; executive committee, Dr. Louis A. Lurie of Cin-

cinnati, Dr. Neil A. Dayton of Boston, Dr. Robert H. Haskell of Michigan, Dr. Groves B. Smith of Illinois, and Dr. Leo Kanner of Baltimore.

Section on convulsive disorders: Dr. R. W. Waggoner of Ann Arbor, Michigan, chairman, and Dr. Nolan D. C. Lewis of New York as secretary.

The Council recommended the appointment of Dr. Samuel W. Hamilton as chairman of the Board of Examiners in place of Dr. Andrew H. Woods, and also appointed Dr. Clarence A. Bonner to fill the vacancy existing on the Board of Examiners through the retirement of Dr. Woods.

The Council recommended for nomination as representatives of this Association to the American Board of Psychiatry and Neurology the following names:

For one year: Dr. Franklin G. Ebaugh, Colorado.

For two years: Dr. C. Macfie Campbell, Boston, Mass.

For three years: Dr. Edward A. Strecker, Philadelphia.

For four years: Dr. John M. Murray, Boston, Mass.

The Council appointed the following Executive Committee: The three incoming officers, and in addition, two members of the Council, Dr. William C. Sandy of Pennsylvania and Dr. George H. Stevenson of London, Canada.

The total registration of 1453, of whom 702 were members, exceeds all previous records for attendance and is a splendid tribute to the excellence of the program and to the fine work of committee chairmen and others responsible for the conduct of the meeting.

ARTHUR H. RUGGLES, M. D.,
Secretary.

THE AMERICAN COLLEGE OF PHYSICIANS 1942 MEETING.—The American College of Physicians announces its twenty-sixth annual session to be held in St. Paul, Minn., April 20-24, 1942. Dr. Roger I. Lee, of Boston, is President of the College, and will be in charge of the program of general sessions and lectures. Dr. John A. Lepak, of St. Paul, has been appointed General Chairman, and will be in charge of the program of hospital clinics and round table discussions, as well as local arrangements, entertainment, etc. Mr. Edward R. Loveland, Executive Secretary of the College, 4200 Pine Street, Philadelphia, will have charge of the general management of the session and the technical exhibits.

Other medical societies are urged to note these dates in order that conflicts in meeting dates may be avoided for mutual benefit.

POSTGRADUATE INSTITUTE FOR STATE HOSPITALS.—The third regional postgraduate Institute for state hospitals was held at the South Carolina State Hospital, Columbia, South Carolina from April 14 to 26, 1941. The Institute was under the sponsorship of The American Psychiatric Association through its Committee on Psychiatry in Medical Education, and was financed by a grant from the Rockefeller Foundation. The average daily attendance was fifty-five with a total of seventy-eight registered for the Institute. Sixteen states were represented. A variety of subjects was discussed including neuroanatomy, neuropathology, psychobiology, psychotherapy, neuroroentgenology, neuro-ophthalmology, neurosurgery, electroencephalography, clinical psychiatry, clinical neurology, and a group of related subjects.

The fourth Institute will be held at the Western State Hospital, Fort Steilacoom, Washington, from September 1 to 13, 1941. Those interested in attending the coming Institute should communicate with either Dr. William N. Keller, superintendent, Western State Hospital, Fort Steilacoom, Washington, or Dr. Franklin G. Ebaugh, Colorado Psychopathic Hospital, Denver, Colorado.

AMERICAN OCCUPATIONAL THERAPY MEETING.—The twenty-fifth annual meeting of the Association will be held in Washington, D. C., September 1-5, 1941, in conjunction with The American Congress of Physical Therapy, with headquarters at the Mayflower Hotel. The membership, representing the United States and foreign countries, now totals approximately 1400. Occupational therapy received a great impetus in the first World War, and the brief training courses then arranged to meet the emergency have since been expanded to include three years' work, with standards approved by the American Medical Association. In the registry of the American Occupational Therapy

Association 1999 qualified therapists are now enrolled.

It is appropriate that the 1941 meeting should be held in Washington, the headquarters of national defense. The local convention committee has arranged a program which will be unusually interesting from educational, scientific and social standpoints. Well-known specialists, including psychiatrists, physicians, physical therapists, occupational therapists, nurses and authorities on cardiac diseases, tuberculosis, and veterans and defense problems will participate in the general sessions and round-table conferences. There will be a display of educational and scientific exhibits with unusual types of therapeutic activities, case histories and photographs. There will also be demonstrations of occupational therapy technique.

Sightseeing trips have been arranged and there will be opportunity to visit various hospitals and institutions. Social highlights of the week include a tea or reception at the White House and the banquet at the Mayflower Hotel.

Further information may be obtained by writing to the Chairman of the Program Committee, Mrs. Arvilla D. Merrill, O.T.R., St. Elizabeths Hospital, Washington, D. C.

PSYCHIATRIC ASPECTS OF CIVILIAN MORALE.—In the psychiatric section of the A.A.A.S. meeting at Durham, New Hampshire, June 26, 1941, a symposium on this subject was presented by The American Psychiatric Association with Dr. Arthur H. Ruggles as chairman.

Dr. Douglas A. Thom, professor of psychiatry, Tufts Medical School, discussed "The Psychiatric Aspects of Civilian Morale in Relation to Children." Dr. A. Warren Stearns, dean of Tufts Medical School, spoke on "The Psychiatric Aspects of Civilian Morale in Relation to the Aged." Dr. Lydia G. Giberson, psychiatrist of the Metropolitan Life Insurance Company, New York, discussed "The Psychiatric Aspects of Civilian Morale in Relation to Industry." Dr. George K. Pratt, medical director of the Connecticut Society for Mental Hygiene, outlined "The Psychiatric Aspects of Civilian Morale in Relation to the Community." Dr. Samuel W. Hamilton of the Division of Mental Hygiene, U. S. Public Health Service, Washington, discussed "The Psychiatric Aspects of Civilian Morale in Relation to the General Public."

ROUND TABLE CONFERENCE ON OCCUPATIONAL THERAPY.—The program of the round table on occupational therapy at the Richmond meeting, at which Dr. L. E. Hinsie was moderator, was built around the question of national defense. Miss Susan Wilson reviewed the contribution of occupational therapy to the World War, 1914-1918, stressing the value of the work in patients with war neuroses.

Mr. Everett S. Elwood gave an enlightening talk on the present status of occupational therapy from the standpoint of national defense. Among other things he reviewed the question of military or civil status for occupational therapists, and indicated that this question was under advisement by military authorities.

Miss Geraldine Lermit stressed the need for greater coordination between the personnel of the medical and occupational therapeutic units.

Dr. David C. Wilson spoke of the need for taking care of the civil population in contrast to the military.

Dr. Roy D. Halloran's paper was a real scientific review, and by far one of the best guides to the practical aspects of occupational therapy yet presented.

DR. WHITEHORN GOES TO JOHNS HOPKINS.—Announcement has been made that Dr. John C. Whitehorn, professor of psychiatry at Washington University School of Medicine, St. Louis, has been appointed to the chair in psychiatry and director of the Henry Phipps Psychiatric Clinic at Johns Hopkins University, to succeed Dr. Adolf Meyer who retires this year.

The selection of Dr. Whitehorn for this very important post is to be regarded as a happy choice. His well established reputation as clinician, teacher and investigator predicates success in upholding the high traditions of Johns Hopkins.

Psychiatry still partakes somewhat of the weakness of psychology—the echoes of the schools have not yet died away. Perhaps in no other discipline is it so necessary that a leader be firmly grounded in the scientific method and the technique of the laboratory. Dr. Whitehorn's training, experience and personality fully satisfy this condition.

PSYCHIATRIC SEMINAR FOR MEDICAL EXAMINERS OF DRAFT BOARDS IN CALIFORNIA. Under the auspices of the Northern California Society of Neurology and Psychiatry, and arranged in collaboration with the Deputy Director of the United States Selective Service System, a two-day psychiatric seminar was held in San Francisco, June 20 and 21, 1941, for two main purposes: (1) To acquaint the medical examiners associated with the Selective Service System with neuropsychiatric principles and sufficient working knowledge to enable them to act more effectively in weeding out the mentally unfit at the outset; (2) To generally "air" the neuropsychiatric problems encountered in the Selective Service Scheme with the hope of improving the present system wherever possible or feasible.

In the main, responsible for the arrangements were: Walter Treadway, M. D., Medical Director, U. S. Public Health Service; Harry Stack Sullivan, M. D., Consultant in Psychiatry for the Selective Service System; Lieut. Colonel B. S. Thomas, M. C., United States Army.

NOTICE TO MEMBERS SERVING IN THE ARMED FORCES

In order that the membership lists may be kept up to date, it will be deeply appreciated if members of the Association who are called to service in the armed forces of the United States or Canada will send notice of any change of address or station to the Executive Assistant, Mr. Austin M. Davies, Room 708, 9 Rockefeller Plaza, New York, N. Y.

BOOK REVIEWS

RECENT NEUROPSYCHIATRIC PUBLICATIONS ISSUED IN SOVIET RUSSIA (1939-1940).

From time to time, and with increasing frequency, this JOURNAL has been receiving neuropsychiatric publications from Soviet Russia and we have been interested to note their rapidly changing character. Not so long ago the publications reaching us were either largely of a diffuse and speculative nature, or they consisted merely of summaries of foreign publications, principally Germany's. The more recent publications are obviously based on abundant clinical experience, dealt with for the most part in a fairly competent way and occasionally even in an original way.

Perhaps the most interesting among the noticeable trends are the following:

(1) Evidence of a firm determination to furnish neuropsychiatric service to all who may require it and to develop facilities for that purpose on a scale hitherto unheard of in Russia, and apparently now exceeding that existing anywhere else. This can be definitely stated for the city of Moscow and probably a large area surrounding it. It may also be true of some other urban centers, but almost all of the literature that has come to us was sent out by the institutions in and around Moscow.

(2) An integration of neurology and psychiatry, with all emphasis on the medical problems, rather than legal ones, and apparently based on an assumption of an organic basis for mental as well as physical manifestations. There seems to be very little in the way of allowance for so-called functional manifestations in the psychiatric as well as the neurologic field.

Special attention might be called to a monograph by Professor Shmaryan, entitled *"Psychopathologic Syndromes Occurring in Connection with Lesions of the Temporal Lobes."* This monograph is based mainly on 34 cases, fully reported, in which tumors or traumatic lesions affecting the right or left temporal lobe had been carefully observed clinically, dealt with neurosurgically, and further observed thereafter for neuropsychiatric residuals or for complete recovery with total absence of such residuals.

The author demonstrates, I believe convincingly, that the old position of Oppenheim and others, to the effect that the temporal lobes, especially the right one, constitute a silent region, is no longer tenable. He stresses particularly the cases of slowly developing benign growths, such as meningiomata and oligodendrogliomata, in which general symptoms are not so much in evidence, but mainly or solely localizing syndromes; and he stresses further the olfactory and auditory psychosensory manifestations of these growths. He is able to report a number of instances in which these psychosensory manifestations have completely disappeared following neurosurgery. Among other psychopathologic manifestations he describes those which are attributable to extensions of the growth to the parietal region, especially on the left side, and those others which are attributable to extension of the growth to the thalamic region.

Of course, the purely neurologic syndromes are not neglected and he mentions five distinguishable types, as follows: temporo-peduncular, temporo-capsular, temporo-pallidal, temporo-cerebellar and temporo-hypophyseal.

Another outstanding example of the newer psychiatric works in Soviet Russia is a text from the pen of Professor G. E. Sukhareva, who is a woman director of one of the child psychiatric clinics in Moscow. The title of this work is *"Clinical Lectures on Child psychiatry."* Following a 43-page introductory part on general psychopathology, there is a section on special psychopathology of childhood dealing with infectious and post-infectious psychoses; residuals and sequels of encephalitides; mental disorders associated with chorea; mental disorders associated with congenital syphilis, including juvenile paresis; mental disorders based on traumatic cerebral lesions; epilepsy, including its psychic equivalents; early forms of schizophrenia, etc.

The second volume of this text deals with borderline types, reactive conditions, neuroses, psychopathic states, manic-depressive psychoses and mental deficiency.

This text is for advanced students and contains very little that is conjectural or speculative. Its constant reference is to clinical material apparently observed in great abundance.

In my opinion this text would compare favorably with any similar work published in German, French or English, but is by no means a book slavishly modeled on foreign treatises. On the contrary, the author seems to be hardly aware that there are texts on child psychiatry in Western Europe or in the United States. She states that "in many of the bourgeoise countries scientific thought in the field of psychiatry is passing through a crisis, but with us in the U. S. S. R. all conditions have been created for the successful development of the sciences in general and of the medical sciences in particular." She knows as little about what goes on here as most of us here know about what goes on over there.

A. J. R.

HYDROTHERAPY IN PSYCHIATRIC HOSPITALS. By *Rebekah Wright, M. D.* (Boston, Mass.: The Tudor Press, Inc., 1940.)

One of the favorite questions of the late Dr. Douglas Singer, in his examination of candidates for professional recognition in psychiatry, was an extremely simple one. It consisted merely in requesting the candidate to outline, in detail, his

orders to his nurse for a continuous bath. The varied and often startling replies indicated only too clearly that men fully trained in psychopathology and case management were far too often content to rely solely on their physiotherapists for their hydrotherapy.

It is precisely this state of affairs which Dr. Rebekah Wright has set herself to remedy, by giving the physician the information with which to prescribe water treatments intelligently and precisely. Her book, which is based on years of experience, and is a revision of a volume first published nearly ten years ago, is so minute in its description of methods that it is a valuable text for the nurse, and is also so comprehensive in its discussion of indications, contraindications and dangers that it rightly belongs in the library of every practicing psychiatrist. Throughout the book emphasis is placed on record keeping, and on the importance of individual prescription, so that it is possible by its use to evolve in each case a thorough scheme of intelligent treatment. There are chapters on the planning of hydrotherapeutic installations, which, as has been pointed out by Dr. May in the foreword, is the responsibility of the physician in collaboration with an architect, rather than that of the architect alone. Two-thirds of the text is devoted to descriptions of specific procedures in detail, and about one quarter to a section for physicians containing suggestions for the use of the various therapies described.

While of course it is intended that practical demonstrations, with or without moving pictures be used in training physiotherapists, numerous illustrations amplifying the written matter are more than adequate for the physician's understanding of the techniques employed. Altogether it is an excellent book, which should be compulsory reading for all internes entering a psychiatric service, as well as being a useful reference for their seniors.

Leslie R. Angus, M. D.,
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Hydrocephalus: Its Symptomatology, Pathology, Pathogenesis and Treatment. By *Otto Marburg*. (New York: Oskar Piest, 1940.)

This book shows the complexity of the problems of hydrocephalus. The author's observations do not clarify these problems and do not prove his conclusion that "hydrocephalus is produced by a disturbance of water metabolism."

The clinical and pathological findings in his case reports are too vague to be of value, and his methods of medical treatment by hypertonic saline, theobromine and by thyroid and pineal extracts combined with sodium iodide, do not appear to have been strikingly successful. The author recommends prolonged treatment by small doses of x-ray on the assumption that it decreases the permeability of the blood-vessels but "children under one year of age are to be treated with x-ray only in cases of emergency."

Eric A. Linell, M. D.,
University of Toronto.

Changes in the Lipide Contents of Serum in Patients with Manic-Depressive Psychosis. By *Gudrun Brun*. Translated from the Danish by *Hans Andersen, M. D.* (Copenhagen: Ejnar Munksgaard, 1940.)

In this little book Dr. Brun describes investigations she has carried out partly in the department of psychiatry, the Rigshospital, and partly in the University Institute of Biochemistry, Copenhagen.

The purpose of her study was "to clear up whether the serum lipide curves after fat ingestion in patients with manic-depressive psychosis undergo such changes in form that they may be said to differ noticeably from the form of the corresponding curves in normal patients and in patients with other psychoses."

Before launching into an account of her actual studies, the author has devoted the first four chapters to the literature bearing on the subject. These chapters give a very handy and critical survey and should be excellent for psychiatrists and biochemists interested in this field.

Chapter I deals with normal serum cholesterol values in which Dr. Brun very rightly stresses the importance of considering the normal range to be wide, extending from a minimum of 100 mg. per cent to a maximum of 400 mg. per cent. The variations found during menstruation, pregnancy and undernutrition are discussed.

Chapter II deals with variations under pathological conditions.

In Chapter III the effect of fat and cholesterol ingestion upon the serum cholesterol in normal individuals and in patients suffering from conditions other than mental disease is discussed.

Chapter IV recounts previous studies in mental disorder.

Chapters V, VI and VII describe the author's own experiments in which reliable methods and careful controlling of conditions appear to have been conducted throughout. Charts and findings are recorded for each individual case. A total of 83 persons were investigated. Twenty of these were normal; forty diagnosed manic-depressive psychosis (endogenous variety). This group contained patients in the manic phase and patients in the depressed phase. The third group consisted of twenty-three patients suffering from other psychoses and included schizophrenia, psychoneuroses and, of special interest, a group suffering from "psychogenic depression."

The author found the quotient free cholesterol, total cholesterol to be frequently higher in patients diagnosed manic-depressive psychosis. She concludes "the frequent occurrence of increased quotients in manic-depressives makes it justifiable to consider this phenomenon as something associated with manic-depressive psychosis and that its presence confirms the diagnosis."

After ingestion of cholesterol in olive oil or olive oil alone there was a fall in total cholesterol in manic-depressives whereas in normals or in mental cases other than manic-depressives there was a rise.

Total fat and phosphatides show a rise in manic-depressives in the ingestion experiments and the rise is a good deal higher than in normals or in mental patients other than those diagnosed manic-depressive psychosis.

Dr. Brun advances two theories to explain the fall of blood cholesterol in manic-depressives after ingestion of fat. She suggests the possibility that cholesterol is necessary to aid the absorption of fat into the intestinal epithelium or to neutralize the toxic effects of bile acids absorbed. In either case a withdrawal of cholesterol from the blood serum would take place. This however would be compensated by a regulatory mechanism probably situated in the central nervous system. In manic-depressives this regulatory mechanism may be faulty being less sensitive and failing to compensate at once, with the result that the serum cholesterol falls after fat ingestion and remains low for some time.

The author also suggests the possibility that cholesterol may be necessary for the depositing of fat as well. The low cholesterol available in the blood serum in manic-depressives during the ingestion experiments would retard the deposition of fat thus explaining the high neutral fat and phosphatide following fat ingestion.

Dr. Brun's work should be of interest to psychiatrists and biochemists alike. Her findings would lend strong evidence to the diagnosis of endogenous manic-depressive psychosis. It is always encouraging to learn of possible abnormal biochemical findings in the so called functional psychoses especially when the findings as in this study would seem to be specific for one particular grouping in the psychiatric classification. The author's theories are refreshing and stimulating, particularly her suggestion that the abnormal cholesterol values may be due to faulty regulation by a central nervous system centre which she feels is "close to the site of the changes that bring about the manifestation of manic-depressive psychosis and that this centre thus is attacked too in the development of this disease."

The author concludes by suggesting possible lines of attack in the investigation of this theory.

J. G. Dewan, M. D.,
University of Toronto.

Psychiatric Clinics for Children. By *Helen Leland Witmer*. (New York: The Commonwealth Fund, 1940.)

Through three divisions of an interesting volume Dr. Witmer explores the development of psychiatric services in the smaller cities and rural areas of this country. (1) A relatively short section discusses the development of the theory underlying treatment in child psychiatry. (2) A little less than half of the book describes various government-operated clinic programs in several states. (3) The remainder is a discussion of the problems and principles involved in future programs in this field. The author is clear in her writing and an attractive and accurate presentation has been made by the publishers.

The three chapters relating to the recent developments in psychiatric theory are scarcely full enough to give the amateur any more than the feeling that a dynamic approach to these problems is widespread. And while the more sophisticated will not argue with Dr. Witmer's emphasis upon the contributions of Adolf Meyer, Freud and Rank, they will feel that other names and developments could have been included. It is a bit puzzling to know just who will profit from so summary a treatment of the last fifty years in psychiatry.

The section dealing with a description of the working of various programs (state-wide, city travelling clinic, operated by state hospitals, operated by psychopathic hospitals, etc.) is of real service. Here the administrator can find "what has been tried." There is a listing of the various auspices under which these rural (and smaller city) clinics have been developed and data as to their life histories. Of the six hundred or so such clinics it is interesting to get this picture of success and failure. A few of the more ambitious programs are treated in considerable detail; but accurate as this part of the book is, it lacks the warmth and realty which these clinic ventures demand. I can't imagine an administrator halting at any page with "that's the thing that we should try." Dr. Witmer in writing this book was perhaps not interested in selling wares. More to the point however is the fact that the development of these clinic services up to the present has been largely a personal affair. This review holds no brief for that—there is no question here as to what has been good or bad. The book gives no hint of the possibility that for another generation these frontier ventures will be largely colored by the personalities of those who fashion them. It would be unfortunate to be misunderstood here—those who know the pictures will find Dr. Witmer's descriptions accurate and complete. But those who don't, will think of them as line drawings—completely missing the warm color or gray daubing that they actually are.

And the reviewer feels that much the same might be said of the third section. It is certainly fair to say that most of the individuals who have been struggling in this field have given quite as much thought to the "things we should hope to do" as does this volume. Convincingly Dr. Witmer points out that we must have a clear conception of just what these clinics are going to be able to accomplish—and shows that up to date they have not decreased institutionalization for either psychosis or crime. But I suspect that few will be convinced. It is my surmise that for some years many communities and states will, with a fine but foolish sort of adolescent bravery, try this and try that.

These last statements scarcely do credit to this section of the book. With something of the exactness of the lawyer's brief it demonstrates that we should not build a program unless we know pretty clearly what it is we hope to accomplish. It is similarly logical in pointing out that there has been great wastage in money and effort. The author stresses that the character and training of the staff

depends very largely on an accurate blueprint as to "what we are really going to try to do." There is just as compelling an argument that the sophistication and attitudes of the community must be carefully measured before a venture is begun. These matters are most minutely considered, and if you find a flaw in the argument you've better eyes than I. Before I put the book down I pencilled a very brave Q. E. D. at the bottom of page 437.

Nevertheless I hazard (and hope, if you don't mind) that for another ten years certain administrators will call in certain persons to "wonder whether it wouldn't be worth while trying this." With the challenging accuracy of the paleontologist, Dr. Witmer has constructed a great image from pretty meager data. Dispelling the mists that cover most of it, peering into the darkness that enshrouds it—these will cost many eyes and years of heart-breaking failure.

But I think that it will be a much more realistic approach.

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BACTERIOLOGY IN NEUROPSYCHIATRY. By *Nicholas Kopeloff, Ph. D.* (Baltimore: Chas. C. Thomas, 1940.)

The purpose of this book as stated in the preface is:—"to present succintly the contributions which bacteriology and immunology have made to the study of nervous and mental disorders."

"The attempt to include a comprehensive bibliography has been made only in the application of bacteriology to psychiatry. Data concerning bacteriologic research of a more general nature has been incorporated so satisfactorily in the standard texts that there was no point in filling the background. Rather it appeared advisable to limit the references to recent advances in the field. Even here one had to set a deadline: January 1, 1940."

The scope of the book is indicated by the main sub-divisions: Diseases of Known Etiology with Primary Involvement of the Nervous System; Diseases of Known Etiology with Secondary Involvement of the Nervous System; Diseases of Unknown Etiology Involving the Central Nervous System; Immunology of the Central Nervous System.

Aside from the functional psychoses, some fifty-odd clinical and etiological entities (due to bacteria or their toxins, viruses, protozoa, parasites, and unknown agents), are briefly considered. One section, as above noted, is devoted to immunology. The clinical or other information given about each condition is limited but may suffice to orient workers whose main interest is in the laboratory aspects of medicine. Topics such as leprosy, protozoa, helminths, arthropods and botulism carry few references. Other topics have more extensive bibliographies, among these are neurosyphilis, epidemic cerebrospinal meningitis, special types of encephalitis and encephalomyelitis, epidemic encephalitis (Economo), anterior poliomyelitis, virus diseases, diseases caused by pyogenic cocci, diseases due to gram negative rods, autointoxication, toxins in schizophrenia, special properties of the blood and serum of psychotic patients, the nervous system and antibody production, immunological studies. Bacteria, toxins and allergins as possible etiological agents in epilepsy receive still fuller consideration (97 references) as might be expected in view of the current interest in this topic.

This book should serve a useful purpose for laboratory workers in psychiatry, especially as many, or perhaps most of them, are at a distance from adequate medical reference libraries. This little volume will also afford them a ready means of discerning what topics afford a promising field for further research in bacteriology, as well as those which are currently most popular.

CLIFFORD B. FARR, M. D.,
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THE PLANS OF MEN. By *Leonard W. Doob.* (New Haven: Yale University Press, 1940.)

The author, who is assistant professor of psychology at Yale University, proposes that his book should be considered as a "primer about man and his plans," and as embracing a "specific way of viewing and thus appraising the problems of a troubled era." He defines plans for men as, "consisting of the discovery of means to achieve a goal for a particular people in a specific environment." Thus planning is pointless and futile without knowledge of the goal to be achieved or of the people and their physical and social environment to be affected."

The present, the future and the possible values inherent in the plans of men that are designed for men, are related to the selection of the plan to be employed; to the goal to be attained and the consequences resulting therefrom. The interpretation of these values are considered as "good and correct" or as "bad and wrong," depending in part upon an historical survival or the death of past practices, or upon a biased point of view that colors the judgment at the moment.

It is maintained by the author that "the nature of human beings should determine all three value judgments"; that "the values in which men believe seem to affect the course of societal development"; that "planning is a relativistic matter"; and that "the plans of men do not have to be and cannot be directed toward eternity."

In general the book is devoted to an informal and unavoidably incomplete discussion and survey of certain phases of the biological and social sciences. Such a survey is intended to serve the purpose of demonstrating how adequate or inadequate man's knowledge is concerning the nature of man, his social environment and his goals. He questions whether large scale planning is possible in the light of our present knowledge concerning man. Whereas gaps in this knowledge must be filled before many types of plans can occur, nevertheless he believes that "the social sciences are important instruments for determining the nature of

man and his social environment and therefore contribute to the requirements of planning."

His survey raises a variety of perplexing problems that confront planners. In this connection he comments "that men and women alone embody values and only by analyzing their various activities can these values be understood." This is but another way of saying that scientific contributions to the knowledge of why man behaves as he behaves is essential, not only for the understanding of man's individual feelings, acts and thoughts, but also man's collective behavior in terms of community living and all which the latter implies.

This interpretation is borne out by the author's discussion of the nature of man. He considers that man is a higher animal, a social, political, economic and human being. He is somewhat apologetic for his attempt to cover the subject of "the nature of man" under these five headings. Nevertheless he proposes several points as the guiding principles in the formulation of plans to be designed for men. These principles involve man's biological equipment which sets wide limits to what he may learn in the course of his development; the potential and actual differences that obtain in all man's activities, whether they be social, political, economical or personal and in these man's personality as a whole is involved; that man's knowledge concerning himself, his values and his society is saturated with symbols and he functions in accordance with his cultural and physical surroundings and the experiences he has had therein; that man can be gratified and frustrated in a variety of ways yet remain socialized in respect of the most diverse kinds of social values, their reciprocal impacts, one upon another, serving to regulate gratifications and frustrations in a totally integrated manner; that man is actively interested in these latter situations only when the goals he seeks are linked to them, with the result that changes occur slowly in established social institutions; and that man's behavior is influenced by the reciprocal impacts of either harmonious or discordant interpersonal relationships. The author suggests that the plans of men can be understood more effectively when all man's activities and not special segments of them are taken into account.

One gathers the impression that the main contention of this volume is that planning, when designed for men, should seek to afford "the maximum of gratification and the minimum of frustration." This contention, as the author points out, tends "to raise the problem of value and plan in terms of individuals who change the values and for whom all plans should be designed."

He amplifies this conception further as follows: "Whenever men talk of improving their status, whenever philosophers argue that one value is 'higher' than or 'superior' to another, whenever politicians plead for reform or against it, whenever physicians work for the cause of health, whenever economists warn that an economic principle is about to be violated, whenever psychiatrists adjust their patients to an environment, it could be shown that their conception of the desirable value, when its consequences upon individuals are determined, involves the ideal of increased gratification or decreased frustration or both for one person or a group of persons. Their particular conception of value may be expressed differently, to be sure, but it is here asserted that other verbalizations are psychologically equivalent to this formulation that is being proposed."

The author also contends that a mode of behavior which is either gratifying or frustrating to people at one time does not mean necessarily that it should be eternally gratifying or frustrating to them or their descendants. Happiness, contentment, and satisfaction are subjective states and since human beings may be gratified and frustrated in such a variety of ways, it naturally follows that no one way can ever be called absolutely satisfactory or absolutely unsatisfactory. Thus planning for men must be freed of absolutes, and this adds to the difficulties of planners.

The utilization of the "value of maximum gratification and minimum frustration" is reminiscent of hedonistic and utilitarian philosophies and is so recognized by the author whose point of view is "that frustration cannot be entirely eliminated" since "socialization is inevitably frustrating since the human organism has to be socialized to survive and to live in society." Moreover, he points out that human interest, due to the ever present fact that people seek different goals, can never be completely harmonious," hence there will always be some form of social conflict and consequently some degree of frustration. In this connection he comments "nor can it be forgotten that the learning of substitute responses occurring under the conditions of frustration, and the activities acquired in this way, lead thereafter to significant gratifications for the organism."

The author briefly summarizes the implications of formulating desirable values in planning for men in what he calls psychological terms as follows: "Man is seeking a maximum of gratification and a minimum of frustration in ways peculiar to himself and his society." Perhaps this is another way of saying that men seek to find emotional security in ways peculiar to themselves and to their society. The author comments further, "His methods of finding gratification and avoiding frustration in the future can be anticipated to a certain extent by the social sciences." This may carry with it the implication that the so-called social sciences may contribute to the positive aspects of better social integration and the promotion of positive mental health.

He further remarks that "due to the placidity of his nature, he (man) might achieve this value in ways different from the ones he is now employing or can be expected to employ. Through planning he should obtain more gratification and less frustration in a manner that will be based on his present way of life, the kind of life he will live in the future, and the kind of life his nature might permit him to enjoy. To disregard his present and future and potential ways of life is perhaps to defeat the purposes of planning by adding new

frustrations which will make him conform to arbitrary values."

One may venture to interpret the latter comments to mean that plans for men must make constructive contributions eventually to community living in terms of social sanitation which in its scope embraces the more positive aspects of healthful and effective living. Moreover, that our present knowledge of man can make some contributions to this field, not necessarily in terms of administration but in the technical sense of integrating that knowledge with those disciplines directly concerned with the positive promotion of human welfare, and that the policies of the social sciences must take into account those contributions which deal with man's knowledge of himself and find ways and means of integrating that knowledge into the practical application of the plans of men.

The author closes his book with the following significant comment: "There is the danger that a book on planning will leave the impression that planning as such is a thoroughly desirable quality for human beings to possess. Planning, however, requires the individual to be rational, to be resourceful, to extinguish spontaneous activity for the sake of future gratification. It is recognized that such a state of intellectualism is necessary only when basic adjustments cannot be made and when there is frustration. Men prefer careless freedom to planned discipline and the joy they derive from planning is not always an immediate one. They must and should plan when the effects of spontaneity are disastrous. Together they must and should plan a fuller life for themselves so that they can remove the necessity for discipline and master planning. The desirable value of planning, a value that cannot be achieved but that must be sought as long as men are more than animals, is to lead a life whose essence is not regimentation or fascism but the freedom to follow individual purposes and desires."

This publication from the "Institute of Public Relations" suggests that our present knowledge of man himself, while incomplete, may contribute, nevertheless, toward better planning for men. In the specific sense the author discusses this knowledge in relation to political, individual, social, economic and regional planning. He also discusses planning involved in fascism, communism and war.

The book is well indexed and contains a list of 164 references. It is worth reading, especially by those interested in the mass promotion of positive mental health. While it leaves much to be desired in the latter respect, it may be considered, nevertheless, "a primer about man and his plans."

W. L. T.

THE MARCH OF MEDICINE. New York Academy of Medicine Lectures to the Laity 1940. (New York: Columbia University Press, 1941.)

The March of Medicine is a collection of interpretive essays given at the New York Academy of Medicine to the laity last year and maintains the same high standards of interest, intelligent selection of subject matter and authenticity as previous similar volumes.

There is a unity to the book despite an apparent scattering among such subjects as the story of the viruses, the use of the bronchoscope and the care of the mentally ill—for there is the unity of the upward surge of science along many separate lines toward a common end.

It is particularly significant, it seems to me, that in a collection of six leading articles of this nature two of them should be devoted to mental diseases. Dr. Abraham Myerson discusses the "Inheritance of Mental Disease," and Dr. Richard H. Hutchings "The Ascent from Bedlam." This is not a bad average for the Cinderella of medicine.

While the book is prepared primarily for the laity, I am sure there are many members of the medical profession who can read it with interest and value to themselves.

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PSYCHIATRY FOR THE CURIOUS. By *George H. Preston, M. D.* (New York: Farrar & Rinehart, Inc., 1940.)

This book is an elementary discussion of the personality and its problems, in homely and easily understandable terms, using illustrations familiar to all. It discusses behavior, defense mechanisms, complexes, obsessions, compulsions, paranoid states, and even precox, manic-depressive and organic psychoses and psychotherapy in an easy, engaging manner.

To the psychiatrist who reads it, this book will supply some ready made answers to questions which may be directed to him by the curious layman.

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INDIVIDUAL DIFFERENCES IN BEHAVIOR RESULTING FROM EXPERIMENTALLY INDUCED FRUSTRATION. By *Clifford Rose Adams, Ph. D.*

A COMPARISON OF CERTAIN VISUAL FACTORS WITH THE EFFICIENCY OF TEXTILE INSPECTORS. By *Arthur W. Ayers, Ph. D.*

A NON-VERBAL APPROACH TO THE THURSTONE PRIMARY MENTAL ABILITIES. By *Dannie J. Moffie, Ph. D.* (Ann Arbor, Mich.: University Microfilms, 1941.)

These items are abstracts of articles which have been reproduced in complete text on microfilm and are available for purchase either in microfilm or paper enlargements. With the introduction of inexpensive reading machines, original material is readily made available to libraries or those engaged in research. Lists of microfilm publications may be obtained from University Microfilms, 313 North First Street, Ann Arbor, Michigan.

C. B. F.

THE 1940 YEAR BOOK OF NEUROLOGY, PSYCHIATRY AND ENDOCRINOLOGY. Edited by *Hans H. Reese, M.D., Nolan D. C. Lewis, M.D.,* and *Elmer L. Sevringhaus, M.D.* (Chicago: The Year Book Publishers Inc. 1941.)

The 1940 edition of the Year Book is an anniversary number—the fortieth. This annual review is as old as the Century. To commemorate this thoroughly adult birthday the editors and publishers have produced a special, substantially enlarged volume.

First comes a preface by the publishers telling the story of the Year Book from its inception, with photographs of the series of editors. In the first edition "Nervous and Mental Diseases" were combined with "Skin and Venereal Diseases" in one volume. The former section, edited by Hugh T. Patrick, comprised 133 pages. The corresponding portion of the present edition numbers 528 pages, which together with the section on endocrinology and the subject and author indices, makes up a volume of 856 pages.

Another feature of the 1940 Year Book is a series of special articles by each of the three editors. Dr. Reese, who edits the section on neurology, contributes an article on "The History of Scalping and its Clinical Aspects," suggested by the case of a patient whose scalp had been torn off in an industrial accident. This well illustrated essay affords an unusual excursion on paths which diverge from main medical highways and dip into history and anthropology for the broadening of one's cultural interests.

Prefacing the section on psychiatry, Dr. Lewis discusses "The Pluralistic Approach to Psychiatric Research." Psychiatry seeks to understand human behavior, a vast complex of interactions, which research naturally inclines to single phenomena among the life processes. It is an indispensable method but not free of disadvantage; the isolated line of investigation "contributes little to the understanding of the personality and tends to produce 'micropsychiatrists' who never comprehend the scope and nature of any disease manifestation."

Dr. Sevringhaus is responsible for the section on endocrinology. In his special article, entitled "Endocrine Disorders of the Female Reproductive System" he reviews 300 consecutive cases of menstrual disorders and reduced fertility, with particular reference to therapeutic measures evolved during the past five years. Endocrine diagnoses were regarded as justified in 91 per cent of the 300 cases, grouped in order of frequency as follows: sex infantilism, adiposogenital dystrophy, reduced fertility, menorrhagia, climacteric cases, dysmenorrhœa.

The editors point to the great loss to science which Hitler's war has brought to the world. The free flow of scientific literature between countries has been stopped and the flood of valuable contributions from Europe reduced to a trickle. As Reese remarks, "The results of this war experience cannot replace the progress which peaceful activities and international exchange and correlation would have created for mankind's benefit."

The Year Book follows the plan of the past few years and still draws upon as much of the world literature as may be available. There is however this year a marked preponderance of English, and particularly American sources. The high quality of the survey has been maintained and this convenient volume is more than ever indispensable as a source of information on contemporaneous activities in the medical disciplines represented.

The psychiatric section contains a review of significant contributions in military psychiatry.

C. B. F.